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## CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

**ADDRESSES AND ORIGINAL ARTICLES**

Certain Aspects of Coronary Thrombosis. By Prof. JOHN HAY, F.R.C.P.—(*Illustrated*).. 787

Developmental Myopia and the Treatment of Myopes. By Sir JOHN PARSONS, F.R.C.S., F.R.S. ..... 795

Clinical Manifestations of Pulmonary Tuberculosis in Childhood. By W. BURTON WOOD, M.R.C.P.—(*With illustrations on plate*)..... 797

Infra-red Plates in Neurohistological Illustration. By Prof. D. M. BLAIR, M.B., and FRANCIS DAVIES, M.D.—(*With illustrations on plate*) ..... 801

Dislocation of the Semilunar Bone. By J. K. MONRO, F.R.C.S.—(*With illustrations on plate*) ..... 801

A New Technique in Gastro-jejunostomy. By IVOR BACK, F.R.C.S.—(*Illustrated*)..... 802

Bacteræmia in Lobar Pneumonia. By IAN M. CHRISTIE, M.B., D.P.H. 804

Multiple Malignant New Growths Associated with Carcinoma of the Œsophagus. By JOHN E. G. MCGIBBON, M.B. (*Illustrated*)..... 806

**MEDICAL SOCIETIES**

Royal Society of Medicine: Section of Obstetrics.... 808

**REVIEWS AND NOTICES OF BOOKS**

The Thyroid Gland, its Chemistry and Physiology. By Prof. C. R. Harington, F.R.S..... 809

Neurology: Psychiatry. Edited by Peter Bassoe and Franklin G. Ebaugh 809

Human Mentality. By Bror Gadelius..... 809

Rose and Carless' Surgery. By Cecil P. G. Wakeley, F.R.C.S., and John B. Hunter, F.R.C.S. ..... 810

Practical Anæsthesia .... 810

Sexualpathologie. By Prof. V. Kafka..... 810

Recent Advances in Plant Physiology. By E. C. Barton-Wright, M.Sc... 810

**LEADING ARTICLES**

EPIDEMIC ENCEPHALITIS RETURNS? ..... 811

ACADEMIC FREEDOM ..... 812

THE FLEXIBLE GASTROSCOPE ..... 813

THE MEDICAL WITNESS .. 813

**ANNOTATIONS**

Immunisation Against Diphtheria with a Single Dose of Antigen..... 814

Special Disability in Writing ..... 815

Ætiology of Perinephric Abscess ..... 815

The New Pharmacy..... 816

Eugenic Sterilisation in Switzerland ..... 816

The Diabetic Motorist.... 816

Intestinal Knots ..... 817

A Combined Radio Set and Hearing Aid ..... 817

The Drug Traffic ..... 818

Agranulocytosis ..... 818

St. Mary's Hospital New Medical School ..... 818

**OPENING OF THE MEDICAL SCHOOLS**

The Burden of Facts. By Sir GOWLAND HOPKINS, F.R.C.P., P.R.S. ..... 819

Preparation for Medical Practice. By Sir FARQUHAR BUZZARD, F.R.C.P..... 820

The Return to Æsculapius. By Prof. W. LANGDON BROWN, F.R.C.P. ..... 821

The Wall Between the Clinic and the Laboratory. By Prof. ARTHUR J. HALL, F.R.C.P. ..... 822

Diet, Exercise, and Weight. By Prof. E. C. DODDS, F.R.C.P. ..... 823

**POST-GRADUATE LECTURES**

Pandemic Acidosis in Children (Dr. REGINALD MILLER) ..... 826

The Value of Pre-operative Investigation (Mr. NORMAN LAKE)..... 826

Indigestion (Dr. ADOLPHE ABRAHAMS) .. 828

**SPECIAL ARTICLES**

The Necessity for a Safe Milk-supply. By Prof. G. S. WILSON, F.R.C.P., D.P.H. ..... 829

Ireland: Election for the University of Dublin.... 832

Medicine and the Law: Statement Refused to Coroner's Officer.—"Physio-medical" Treatment ..... 832

The Medical Defence Union 833

University of Bristol: Inauguration of the Department of Preventive Medicine—(*Illustrated*).. 834

The Medical Register: Untraceable Practitioners in 1933 ..... 835

St. Bartholomew's Hospital Medical College ..... 836

Out-patient Departments: Coöperation with Practitioners—(*Illustrated*) .. 837

Infectious Disease in England and Wales ... 825

**CORRESPONDENCE**

Shock-proof X Ray Installations (Dr. Stanley Melville) ..... 839

Angioneurotic Œdema (Dr. A. G. Auld)..... 839

Ketogenic Diet in Urinary Infections (Dr. R. D. Lawrence) ..... 839

The Indian Medical Service (Col. W. G. King) .... 839

**PANEL AND CONTRACT PRACTICE**

Prescribing and Dispensing 838

**MEDICAL NEWS**

Hospital Dinners: St. Bartholomew's.—St. Thomas's.—Charing Cross.—St. Mary's.—Westminster.—St. George's.—Middlesex .. 840

Royal Faculty of Physicians and Surgeons of Glasgow 842

Gresham College ..... 842

Society of Medical Officers of Health ..... 842

Fellowship of Medicine and Post-Graduate Medical Association..... 842

University of London ... 843

University of Durham ... 843

University of Bristol .... 843

The Psychology of War ... 843

British Institute of Philosophy ..... 843

Grocers' Company Scholarships ..... 843

Mental Treatment Act, 1930 843

Chadwick Lectures..... 843

Surgical Instruments Manufacturers' Association .. 843

London Hospital Medical College ..... 843

International Exhibition of Inventions ..... 843

Health Education Visits.. 843

**OBITUARY**

Robert Morrison, L.R.C.P. 843

**THE SERVICES**

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Service..... 845

**NOTES, COMMENTS, AND ABSTRACTS**

Our Best Friend. By Prof. A. E. BOYCOTT, F.R.C.P., F.R.S. ..... 846

Vocal Disorders ..... 848

Medical Diary ..... 844

Appointments ..... 845

Vacancies ..... 845

Births, Marriages, Deaths. 845

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# ADDRESSES AND ORIGINAL ARTICLES

## CERTAIN ASPECTS OF CORONARY THROMBOSIS*

BY JOHN HAY, M.D. MANCH. & LIVERP., F.R.C.P. LOND., D.L.

SENIOR PHYSICIAN AND PHYSICIAN TO THE HEART DEPARTMENT, LIVERPOOL ROYAL INFIRMARY; PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LIVERPOOL

IN this century there have been two notable advances in cardiology: first, the recognition of auricular fibrillation; and secondly, the perception of coronary infarction as the pathological basis of one type of anginal pain—the "status anginosus." I propose here to deal with certain aspects of the latter.

As knowledge of one disease increases the viewpoint of the clinical observer tends to change. There is at first the thrill of the recognition of a new clinical entity and pleasure is found in the full and detailed description not only of the clinical manifestations but also in the correlation of the pathological lesions underlying and responsible for those manifestations. Attention is focused, data are multiplied, and slowly a well-cut picture emerges, so clear that when the condition is present, a diagnosis can be made with confidence, hardly requiring confirmation by autopsy.

On the fringe of this group of well-defined examples of the full-blown stark malady are others in which one or other essential symptom is either absent or much modified; the picture is blurred. There are variations both quantitative and qualitative in the clinical manifestations, so much so that at times diagnosis becomes almost impossible, or at best difficult. In such patients, if autopsy offers, there is present, nevertheless, the fundamental and critical lesion—giving a true interpretation of the eccentric manifestations.

In the face of these findings, the viewpoint of the observer tends to change, and attention moves from the typical to the atypical, from the obvious to the bizarre.

The writings of Herrick, dating from 1912,[1 2] Libman,[3] Levine and Tranter,[4] Pardee,[5] Longcope,[6] and Wearn,[7] focused attention on coronary thrombosis, and it is a pleasure here to acknowledge our debt to American medicine in this matter. From 1920 onwards there has been a spate of valuable papers including those by Levine and Brown,[8] Wolff and White,[9] Christian,[10] Gibson,[11] McNee,[12] Parkinson,[13] Bedford,[14 15] and Lewis.[16] As a result of this intensive attack we have now a clear picture. We are cognisant of the type and site of the pain, the element of collapse, the nausea and vomiting, the pyrexia, the occasional pericarditis, and the specific and characteristic electrocardiogram; we know the pathological lesion and it is unlikely that such a clinical picture will now escape recognition. But even so early as 1912, Herrick [1] drew attention to the importance of the group of "non-fatal cases with mild symptoms." Their recognition is essential, and it is necessary that the criteria on which to base a diagnosis should be defined as sharply as possible.

The atypical cases fall roughly into two classes: one in which the dominant symptoms are apparently not cardiac and therefore misleading; and one in which the symptoms are similar to those in the major attack but less severe—at times so slight as hardly to arrest attention.

That there must be all grades of severity in the clinical manifestations of coronary infarction is to be expected, bearing in mind the character of the coronary circulation and remembering that the myocardium varies greatly in its integrity. Other things being equal, the results depend on the level in the coronary artery at which the block occurs; for the greater the mass of the myocardium suddenly rendered ischæmic and put out of commission, the more severe will be the clinical disturbance. Again, a relatively healthy myocardium is more likely to recover than one already the seat of diffuse fibrosis; and variation in the collateral anastomosis introduces yet another factor. It follows that there must be all degrees from the mildest disability to the lethal attack.

In every case of coronary thrombosis, however, there has been a "cardiac accident," a lesion resulting in the death of muscle-fibres and, in the event of recovery, fibrosis.

That the significance of the symptoms should be appreciated and the nature of the underlying pathological lesion recognised is of importance, not only because of its bearing on prognosis, but also because the immediate treatment and the handling of the patient is an important factor in determining success or failure. It is well then to consider carefully the evidence which justifies a diagnosis of coronary occlusion in these mild, atypical, and aberrant cases, and then discuss how far this provisional diagnosis, possibly made on rather scanty clinical data, can be substantiated by an electrocardiogram or by the subsequent clinical history.

### The Atypical Case

At the onset, in the atypical, mild, or minimal thrombosis, *pain* is usually present. Does its character afford a clue to the nature of the attack? It is, of course, anginal in type—persistent, continuous, and usually sternal in site, with the recognised lines of radiation. In its intensity it may be mild, nothing more than an ache or sense of bursting or oppression. The important and characteristic features are, however, two: (1) it frequently arises spontaneously, and (2) it persists in spite of rest.

In spasmodic angina, pain is significantly the outcome of either physical effort or emotion, and it soon subsides and disappears with repose and mental calm. The ache or pain of a coronary infarct persists, is peculiarly resistant to morphia, and is measured not by minutes but by hours. This is characteristic and in itself should arouse suspicion. It is not the severity of the pain but the fact that it continues which is of significance.

In angina of effort, amyl nitrite cuts short the pain and after the immediate relief it is unusual for the pain to recur. In contrast to this, we find in coronary thrombosis that even if amyl nitrite affords some slight amelioration this is only temporary and in a few minutes the pain is as marked as before.

Accompanying the pain there is usually restlessness and often respiratory distress, both of which are unusual in spasmodic angina. In the milder attacks, when the pain is only of moderate intensity, the patient frequently feels ill, "done," and exhausted; he is often inexplicably apprehensive, and nausea and vomiting sometimes occur. Symptoms such as these suggest the presence of a coronary infarction. They differ essentially from those of spasmodic

* The St. Cyres lecture for 1933, delivered at the National Hospital for Diseases of the Heart, London, on June 13th.

angina both in their duration and their response to treatment.

In the mildest cases the distress may be so slight that its significance is overlooked. When and if, however, the incidence of cardiac pain, without apparent exciting cause, arouses suspicion, then

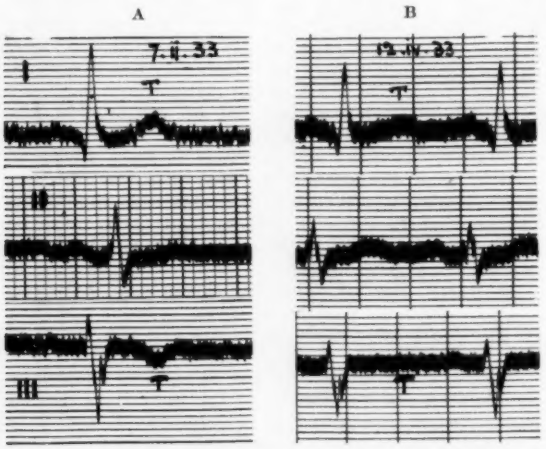



FIG. 1.—(A) Six weeks after C.T.; T inverted in lead III. (B) Fifteen weeks after C.T.; note change in T.

a careful search for corroborative signs must be made, such as typical changes in the electrocardiogram, slight pyrexia, transient pericardial friction, and a moderate leucocytosis. It is well to remember that moderate mild pain such as the above may persist and recur for some days or even weeks, to culminate in a major attack. The pain is then prodromal, the first grumblings of the storm, which breaks later. On the other hand slight pain may be the only immediate manifestation of a small infarction, and fail to attract attention.

In the type of case above described the variation is essentially quantitative rather than qualitative. There is another group in which the symptoms are berrant and in which the clinical findings are undoubtedly misleading. In these the variations are qualitative. Certain subdivisions at once suggest themselves, in which the dominant features are one or more of the following: dyspnœa, symptoms suggesting the "acute abdomen," collapse and/or syncope.

When there is doubt, careful cross-examination may reveal the significant character of the prodromal symptoms.

Pain being the salient feature of coronary infarction we are apt to forget that it may be insignificant or entirely absent. Experience has shown that this more frequently happens in a second attack or when the infarction occurs in patients with a damaged myocardium already suffering from cardiac failure. This aspect of coronary infarction was investigated by Nathan Smith Davis,[17] who published the findings in 76 patients suffering from coronary thrombosis who came to autopsy.

36 (or 47 per cent.) gave a clear history of pain.
29 (or 38 per cent.) had not suffered from pain.
11 (or 15 per cent.) died suddenly.

These figures are arresting for they throw light on the less obvious side of the clinical picture.

In the absence of pain, the outstanding clinical manifestations which indicate a coronary infarct are two—*dyspnœa* and *shock*. The picture varies, but the sudden and spontaneous onset of dyspnœa, either continuous or in paroxysms, is suggestive—more particularly if it is not clearly benefited by rest. Again, a sudden and inexplicable collapse with a drop in the blood pressure may be the first indication of the cardiac accident. "Waves of faintness" overwhelm the patient; his face is pale, ashen, and moist with cold sweat. This was the characteristic feature of the second attack in a case which I shall shortly relate.

It is the suddenness and the spontaneity of the dyspnœa and the collapse which are significant of a coronary block. Syncopal attacks are occasionally, though rarely, the dominant feature in a seizure. Bell and Pardee [19] describe such a case in which a sudden syncope ushered in an attack of coronary thrombosis. This was preceded for three days by prodromal symptoms, a consciousness of "a heavy weight resting on the epigastrium."

CASE 1.—Male, aged 60. No previous illness, but admits to intermittent claudication and occasional giddiness without apparent cause. His doctor states: "The onset occurred when patient was sitting in his chair (Nov. 26th, 1932). He suddenly felt very ill and collapsed, with severe pain between the shoulders, and in a few minutes lost consciousness. On recovery there was agonising pain in both arms and across the chest." A little later during the course of examination the doctor noted slowing and then cessation of the heart beat. The patient's jaw dropped. He was laid on the floor, his chest was vigorously pummelled, and adrenaline and pituitrin were injected. His blood pressure immediately preceding syncope was 107/70 mm. Hg. It rose in three days to 130/90. No history of any vomiting or dyspnœa. Ten days later while in bed there was a third attack of syncope preceded and followed by the sensation of impending death. Pain in the arms had been constant from the onset, and the third seizure was characterised by a great

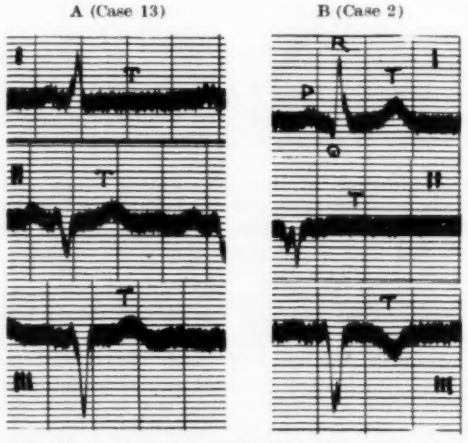



FIG. 2.—(B) (Case 2): two months after C.T. marked inversion in lead III.; iso-electric T in lead II. (A) (Case 13): five months after attack C.T., $T_1$ type; iso-electric $T_1$; Q R S spread.

increase in the pain across the chest, "like a bar," ending in loss of consciousness.

He consulted me six weeks from the onset. Examination did not reveal any evidence of disease of the heart, lungs, or abdomen. The blood pressure (B.P.) was 130/80, and the heart-rate (H.R.) 75. An electrocardiogram (E.C.G.) taken on Feb. 7th, 1933, six weeks after the attack, showed the $T_3$ type of coronary occlusion (Fig. 1A). An E.C.G. on April 12th, nine weeks later, showed rapid improvement in $T_3$ (Fig. 1B).

CASE 2.—Male, aged 52, schoolmaster. In 1928, when golfing, he felt suddenly faint, and his B.P. was found to

be 185 systolic. His attack occurred on Feb. 3rd, 1933, but for three months prior to this he had had slight "effort angina," lasting two or three minutes. When walking quietly back from school he felt a sudden acute pain above the level of the nipples. This pain did not radiate. It lasted from 4.30 to 9 P.M., being relieved by morphia. There was a persistent dull ache for three days. During the attack he was restless and tossed about; he had nausea and vomiting.

On Feb. 17th, when he was first seen by me, there was slight enlargement of the heart. A short systolic over aortic area; $A_2$ accentuated; $M_1$ rather booming; no bruits. B.P., 225/120; H.R., 104; arterio-sclerosis; arteries thick and tortuous; no evidence of dilatation of the aorta. On March 3rd he was feeling much better and had had no recurrence of pain. Walked up Mount Pleasant, a stiff gradient, in comfort. No bruits. B.P., 215/120. Electrocardiography (fundamental rhythm normal) showed Q R S split in all leads and slightly spread; $T_2$ flat; $T_3$ markedly inverted (Fig. 2B). This record was obtained two months after the coronary thrombosis.

A more common difficulty is the case of coronary thrombosis which simulates the acute abdomen. This has been so well described by Levine, Wolff, White, Gibson, Parkinson, and others, that the condition is now less liable to escape recognition. The combination of pain in the upper abdomen, often localised to the epigastrium with rigidity of the abdominal muscles, the vomiting, collapse, and rapid small pulse, with pyrexia and leucocytosis, simulates only too well one of several serious abdominal lesions. Thus cases have been diagnosed as acute pancreatitis, perforation of duodenal or gastric ulcer, gall-stone colic, and cholecystitis. Fortunately for the physician, however, dyspnœa is often present in coronary infarction, and since it is rare in acute abdominal lesions, this has a definite diagnostic value.

## Diagnosis through Complications

There is a further group in which the arresting symptom is, in a sense, secondary to the infarction, and there are certain conditions in which, in the absence of an obvious cause, it is well to bear coronary infarction in mind. The following case for example was one of cerebral embolism occurring in a patient who did not present either auricular fibrillation or valvular disease of the heart.

CASE 3.—On Jan. 1st, 1931, I was asked to see a woman, aged 56, said to be suffering from cerebral hæmorrhage. She had previously consulted me in May, 1930, at the heart clinic, complaining of dyspnœa and a dull heavy sensation across the sternum. At that time her B.P. was 225/115; H.R., 76. There was definite arterio-sclerosis and emphysema. The hemiplegia had occurred in her sleep during the night of Dec. 27th, 1930, and on examination she presented the typical findings of left cerebral embolism. There was a significant drop in the B.P. to 145/90, and a short pericardial rub was audible. On obtaining the following history it was evident that coronary thrombosis was the essential lesion. She had been suddenly seized on Dec. 19th by excruciating pain across the chest and down the left arm, which persisted for five hours. Twelve hours later the pain recurred for a similar period and again next day. Six days later the hemiplegia developed. In hospital she ran a temperature of 100° to 104° F. for two days; pericardial rub over the heart persisted for a day or two and the blood showed a leucocytosis of 13,400.

On Jan. 12th, 1931, the B.P. fell to 105/80, and the lowest level was 95/75 on Feb. 12th. On Jan. 16th, four weeks after the coronary thrombosis, there was sudden pain in the right chest, followed by pyrexia for four days, hæmoptysis, and a dry pleural rub. The E.C.G. on Feb. 27th was of the $T_3$ type. She slowly recovered, and was discharged on March 9th, free from pain and dyspnœa, with normal speech and the paresis almost entirely gone.

Again, pulmonary embolism may be simulated by coronary thrombosis.

CASE 4.—Female, aged 50. Operation by gynæcologist on Feb. 19th, 1932. Ten days later (Feb. 29th) suddenly and seriously ill. Pain in chest; collapsed; moist sounds in chest; slight hæmoptysis and pyrexia. A diagnosis of pulmonary embolism was made by her medical attendant. The fact that there was some tenderness in the calf of one leg, suggesting phlebitis, lent colour to this diagnosis. When she was seen by me a few days later, however, a more detailed description of the attack and the nature of the pain suggested the probability of a coronary infarction. On March 3rd the E.C.G. showed early evidence of cardiac thrombosis (C.T.) (Fig. 3A); on the 14th there was a marked $T_3$ type of C.T. (Fig. 3B); and on the 15th $T_3$ was almost normal, with very low voltage (Fig. 3c). Note very slight evidence of C.T. 3½ months later, but T flattened out in all leads and presence of $Q_3$.

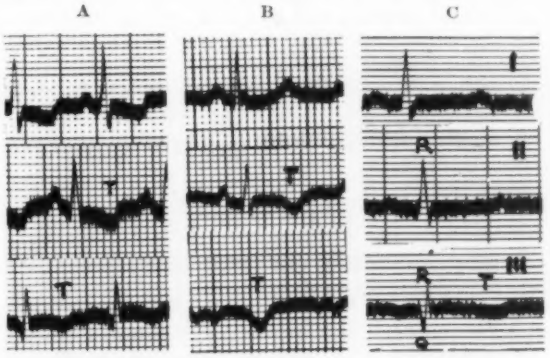



FIG. 3. (Case 4).—(A) Early R-T changes. (B) Developed $T_2$ and $T_3$ inversion. (C) Flattening of T in all leads; voltage low.

We are all familiar with the fact that the inception of a pathological rhythm may be the direct outcome of an infarction—i.e., auricular fibrillation, flutter, or heart-block. Or the infarct may prove to be the factor which initiates progressive cardiac failure, especially in patients with a high blood pressure.

## Clinical Grounds for the Diagnosis

On reviewing this picture it is obvious that difficulties of diagnosis may arise either because the symptoms are so mild, or because the pain is abdominal in site, or indeed because pain is absent and replaced by some other symptom such as dyspnœa or syncope. Another pitfall is that the initial infarct may escape recognition under cover of some complication of the coronary thrombosis. The important thing in such cases is to be alive to the possibility of a coronary thrombosis being the primary and essential lesion. Suspicion being aroused, what information will be of value as an aid to decision?

Before venturing on a positive diagnosis a consideration of the following facts is of value:—

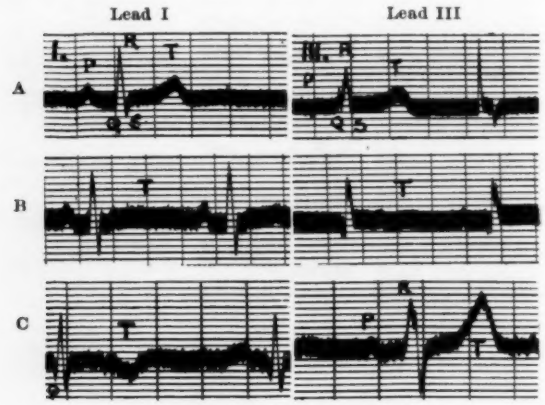
Coronary infarction is rare under the age of 40 and is much more likely to occur in men over 50. It is remarkably rare in patients suffering from chronic sclerosing endocarditis of the rheumatic type and in those with cardio-aortic syphilis.

Arterio-sclerosis is the basic predisposing lesion and is to be found in the majority of patients who develop a coronary infarction.

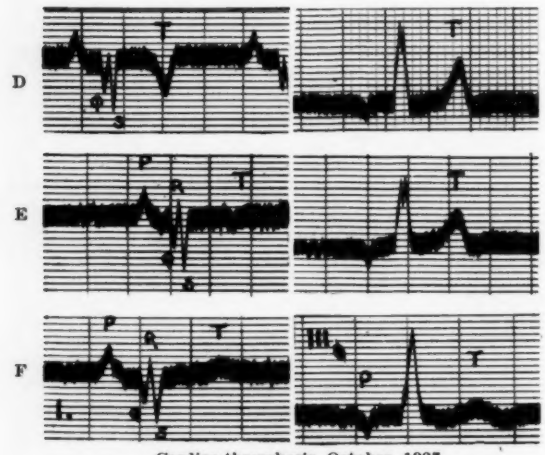
There may be a clear history of a familial tendency to arterio-sclerosis, and cross-examination may reveal the fact that one or more relatives of the patient have died either from angina or from cerebral hæmorrhage.

A high blood pressure is the rule rather than the exception, and with the advent of the coronary block there is usually a sudden drop in the pressure. This fall in pressure may be great and the finding may never again reach its previous level. Such a change is in itself significant and suggestive.

A history of previous attacks of spasmodic angina even of the minor type can often be elicited, and is of value in so far as it indicates that the coronaries are already diseased and narrowed—ripe for an infarction.




Cardiac thrombosis, August, 1925.



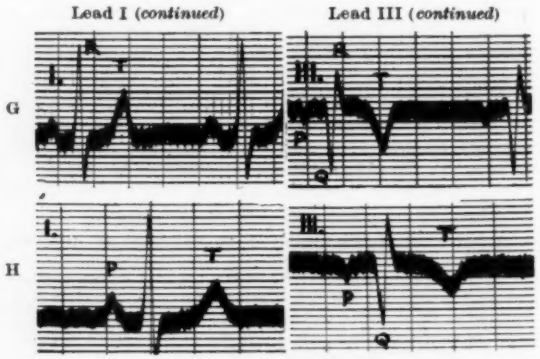

Cardiac thrombosis, October, 1927.

## The Electrocardiogram

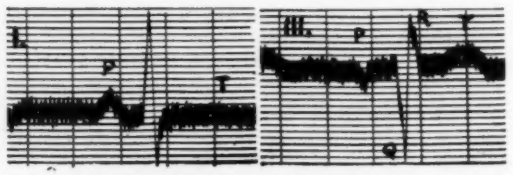
So much for the clinical findings, and their importance is great. Not infrequently, however, with them as our only guide we can do no more than suspect and turn hopefully to the electrocardiograph. Its limitations must be clearly recognised and as frankly stated.

There are certain electrocardiograms which are in themselves almost pathognomonic of coronary infarction. We know also that in the course of time —weeks, months, years—the electrocardiogram slowly changes as the damaged portion of the myocardium is absorbed and scarred. In some patients the records become normal and there is then nothing specific in the electrocardiogram to justify even a suspicion that at some previous moment infarction has occurred. This is the exception; but it is of interest and importance to know to what extent the electrocardiogram can be of help some months after the coronary occlusion, when the process of repair is well advanced, no records having been obtained during the intervening period. This is a question which is apt to arise in practice.

Probably Pardee [20] is correct when he suggests that a certain minimal area of myocardium must be involved to affect the electrocardiogram, while involvement of a lesser area may still cause pain. Others have affirmed that there are silent areas in the heart, silent not only as regards the production of pain but also in their effect on the electrocardio-




Cardiac thrombosis, June, 1929.




Fatal attack, Nov. 20th, 1929.

FIG. 4 (Case 5).—(A) September, 1913: aged 29; normal record; nodal premature beat. (B) January, 1914: T flat, both leads. (C) January, 1923, aged 39: $T_1$ inversion; $T_3$ pronounced, suggesting a lesion of coronary artery; "chronic infarction." (D) October, 1925: aged 41 (two months after first attack of C.T.); typical sharp inversion of $T_1$. (E) December, 1925 (four months after first attack of C.T.): $T_1$ now iso-electric; $T_3$ smaller; Q R S spread and split. (F) April, 1926 (seven and a half months after first C.T.): $T_1$ positive; Q R S split and spread. (G) February, 1928: aged 44 (four months after second C.T.), shows shift from $T_1$ to $T_3$ type with deep $Q_3$. (H) August, 1928 (ten months after second C.T.): negativity of $T_3$ not so pronounced. (I) August, 1929: aged 45 (two months after third C.T.); $T_1$ iso-electric; $T_3$ positive; $Q_3$ pronounced; shows shift from Type 3 to Type 1.

graph—silent at any rate with the ordinary leads. Whatever the explanation, it is agreed that a normal electrocardiogram is obtained in a small proportion of cases of undoubted infarction (Pardee,[20] Smi'h,[21] Parkinson and Bedford [13]). The latter have reported a return to normal in four cases of Type $T_1$—the periods being 4, 8, 12, and 26 months; two cases of Type $T_3$—the periods being 8 months in the first case, and almost complete recovery after 12 months in the second. Levy,[22] in reporting eight cases of mild coronary thrombosis, refers to two in which the electrocardiogram returned to normality in 6 and 19 months respectively. In 382 cases of coronary thrombosis reported by Holland and Levine,[23] 35 showed a normal electrocardiogram at one time or other after an attack. In 16 cases of infarction, 3 gave a normal record. The literature contains numerous examples of similar findings.

The less remote from the time of the infarction the less likely is the record to be within normal limits, though such have been obtained within even a

few days of the attack—becoming abnormal later. It is probable that if serial records were taken regularly from the onset, very few cases would fail to reveal at one time or another frank, typical, and diagnostic deviations from the normal, but in practice it may only be possible to get a very limited number—sometimes a solitary record and that weeks or months from the onset of the attack.

Approximation to the normal is more likely in the less severe infarcts and in those with a liberal collateral vascular anastomosis. An isolated record which is taken some months after an infarction and only deviates slightly from the normal cannot, therefore, be interpreted as conclusive evidence against a diagnosis of coronary block, and such a record justifies a careful scrutiny of the clinical evidence on which the provisional diagnosis of infarction was based.

The following case presents several points of interest.

CASE 5.—The patient was first seen by me in 1907 at the age of 23, complaining of acid dyspepsia and palpitation on effort. There was no history of rheumatism or other infection, except scarlet fever at 4 years. The heart was markedly enlarged, 6 in. to left of midline. Cardiac thrust in sixth space. No abnormal sounds. No bruits. Heart-rate 52. Marked sinus arrhythmia. B.P. 115. Urine nil.

*July, 1913:* As the result of vigorous digging he was distressed by palpitation. The deep cardiac dullness had increased, extending 7 in. to left of midline. Soft systolic bruit present over mitral and pulmonary area. B.P., 125/70. *September, 1913:* Cardiac reserve diminished. E.C.G. within normal limits; no abnormal axis deviation. A nodal premature beat in lead III. (Fig. 4A). *January, 1914:* Four months later E.C.G. showed flattening of T in both leads. General condition much the same. B.P., 140/80 (Fig. 4B). During the war he worked hard—not overseas. In 1920 one brother died

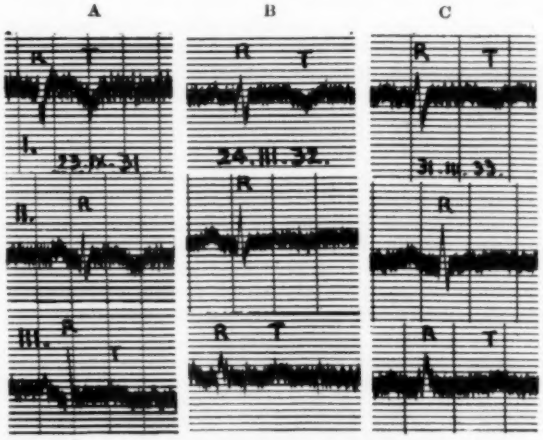



FIG. 5 (Case 6).—(A) Forty-nine days after C.T.; $T_1$ type, low voltage. (B) Seven and a half months after C.T.; $T_1$ less inverted; low voltage. (C) Nineteen and a half months after C.T.; T iso-electric all leads; persistent low voltage.

suddenly of angina pectoris, aged 50. Patient lives within his limitations. *December, 1921:* Heart 6¾ in. to left of midline. No bruits. $P_2++$. *January, 1923:* E.C.G. showed material changes (Fig. 4C). Very suggestive of a coronary lesion, though there was no history of any serious illness.

His *first attack* of anginal pain occurred in the middle of August, 1925. There were no prodromal signs; he had been feeling well—golfing and bathing. Since the attack, very liable to effort angina. No change in heart except that deep cardiac dullness was less, 5½ in. to left of mid-sternal line. An E.C.G. on Sept. 3rd, 1925, taken within three weeks of the coronary thrombosis is a frank $T_1$ type, with Q R S widened and split. Fig. 4D (Oct. 26th, 1925) is similar to that of Sept. 3rd. By December, four months from the attack, he was able to walk half a mile without distress, and was back at business, and the E.C.G. (Fig. 4E) revealed that $T_1$ was iso-electric, Q R S

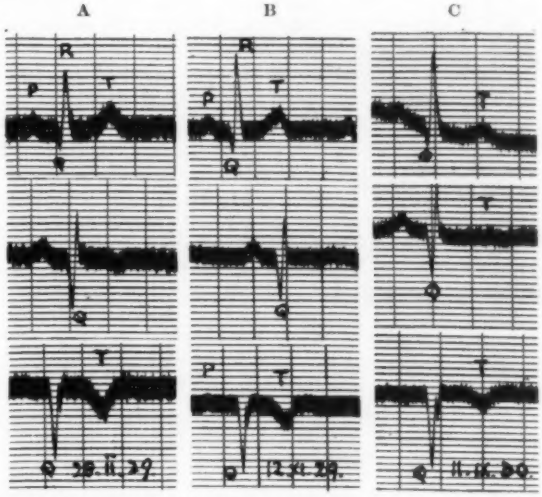



FIG. 6 (Case 7).—(A) Two and a half months after C.T.; $T_2$ type; $Q_3$ +. (B) Eleven months after C.T.; $T_3$ less inverted; $T_2$ iso-electric; $Q_3$ +. (C) Twenty-one months after C.T.; $T_3$ less inverted; $Q_3$ persistent.

remaining abnormal. On April 10th, 1926, four months later, and 7½ months from the cardiac thrombosis, $T_1$ was upright, and the only residual change was to be seen in the Q R S complex. He was still liable to mild attacks of anginal pain. B.P., 135/85 (Fig. 4F).

The *second attack* of coronary thrombosis occurred in October, 1927. He collapsed while driving his car, and experienced a sensation of impending death, but little or no pain. "Waves of faintness" recurred during the attack. There was moderate pyrexia for a week. H.R. about 40; cardiac thrust feeble, heart sounds faint, and for two days a pericardial rub. Recovery was slow. While he was convalescing in the south, on Feb. 6th, 1928, Dr. J. M. H. Campbell electrocardiographed him, and his record shows the $T_3$ type of curve and a deep $Q_3$ (Fig. 4G). By May he was much better. B.P., 165/100. H.R., 60. Urgent business called him to America and he went. On August 30th, 1928 (Fig. 4H), there was little change in E.C.G., but the record for January, 1929, shows a diminution in size of $T_1$, and $T_3$ is less inverted. $Q_3$ still a marked feature. No further pain except after effort. B.P., 160/95. H.R., 72.

The *third attack*, on June 15th, 1929, was preceded by transient prodromal pain. The pain of the attack was severe and continuous, accompanied by moderate pyrexia for a few days. Two weeks from onset he had discomfort and colicky pain in the right lower quadrant of the abdomen with a recrudescence of the pyrexia. Dr. John Parkinson considered that the symptoms were probably due to infarct into the smaller branches of the mesenteric artery. On August 24th, two weeks after the third attack, he was feeling much better. B.P., 135/90. The E.C.G. showed an iso-electric $T_1$, and a positive $T_3$, with no change in $Q_3$ (Fig. 4I).

He died from a *fourth attack*, Nov. 19th, 1929. This attack was preceded by prodromal pain for three days. There was never any explanation of the gross enlargement of the heart discovered in the early twenties. The slow change in the E.C.G. between 1914 and 1923 (very suggestive of changes in the descending branch of the left coronary) occurred without any arresting symptoms. His recovery from successive attacks was remarkable. It is significant that following the $T_1$ attack the Q R S remained abnormal, although the $T_1$ was no longer inverted, and also that $Q_3$ in the $T_3$ attack persisted when

$T_3$ had become positive. The $T_3$ attack gave rise to no pain, though the heart was quite capable of producing pain, as shown by the two following painful seizures.

*Familial tendency.*—Two brothers died anginal deaths.

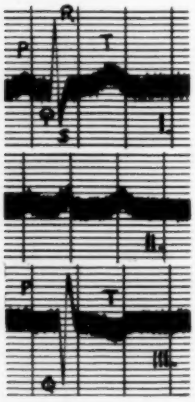


FIG. 7 (Case 8).—$T_3$ type: showing $Q_3$+ three years after C.T.

On examining records taken months or even years after an undoubted attack of coronary infarction, certain abnormalities are found which, though not pathognomonic, occur so frequently that they may be regarded as of diagnostic value, and the presence of one or more of these is certainly significant. As the necrotic mass liquefies and is absorbed, and as fibrous tissue takes its place, it is only to be expected that corresponding variations are to be found in the electrocardiogram. The collective experience of cardiologists appears to justify us in attaching importance to certain combinations of findings and regarding them as of value. Of such a nature are the following :—

Persistent low voltage, especially if present in all three leads.

Notching, slurring, and widening of Q R S in more than one lead.

The presence of a well-marked and persistent $Q_3$.

Persistent slight inversion of T in either leads I. or III., especially lead I.

These findings are suggestive rather than pathognomonic ; they occur in other conditions than coronary thrombosis—one or more of them may frequently

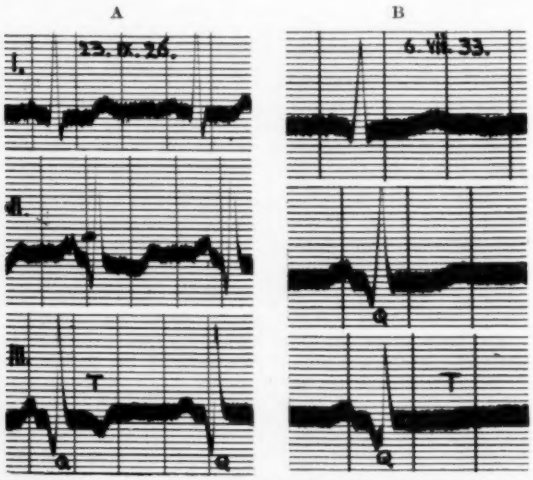



FIG. 8 (Case 9).—(A) Three months after attack of C.T. ; $Q_1$ and $Q_3$ well marked ; $T_3$ type of C.T. (B) Seven years after first attack of C.T. ; six years after second and milder attack ; $Q_3$ and $Q_3$ persisting ; $T_3$ iso-electric.

be seen in diffuse myocardial fibrosis irrespective of any clinical history of coronary thrombosis.

The significance of low voltage in all leads, in association with coronary thrombosis, has been stressed by Levine,[8] Wearn,[7] Parkinson,[13] and others, and its persistence is of sufficient frequency to be of importance in diagnosis.

CASE 6.—Male, aged 65. Prodromal symptoms. Effort angina from August 1st to 5th, 1931. Coronary thrombosis, severe type ; morphia ; duration three days, with pyrexia of 100° F. Heart irregular. Surgical friend anxious to explore abdomen. E.C.G. (Sept. 23rd, 1931), $T_1$ type (Fig. 5A). B.P., 120/80. Occasional pain along

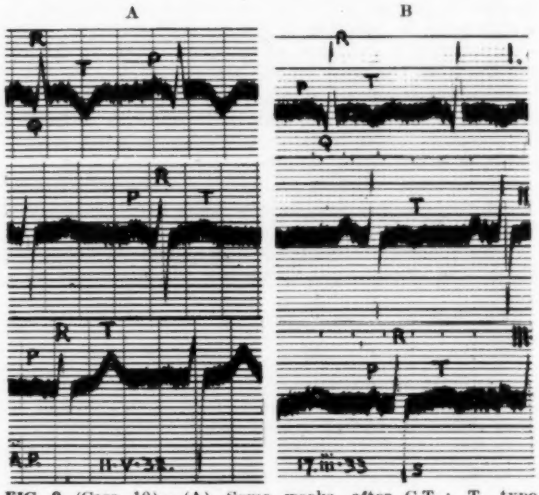



FIG. 9 (Case 10).—(A) Some weeks after C.T. ; $T_1$ type. (B) Eleven months after C.T. ; still slight inversion of $T_1$ ; $Q_1$ persisting ; flattening of $T_3$.

left costal margin. Gradual improvement. E.C.G. (March 31st, 1933) (Fig. 5c). Persistent low voltage ; T flattened all leads. B.P., 120/80. H.R., 64. General condition much improved ; slight tendency to substernal discomfort on effort.

Notching, slurring, and widening of Q R S may indicate nothing more than the presence of a diffuse ischæmic fibrosis of the myocardium, but it is not an uncommon accompaniment of coronary infarction and when in addition there is a low voltage and some inversion of T-wave it becomes a sign of value.

In the last few years increasing emphasis has been laid on the presence of a large Q deflection in lead III. in patients suffering from coronary thrombosis. Wilson [24] drew attention to this in 1926. Since then, Bedford, Parkinson, Levine, Pardee,[25] and Levy[22] have all noted its relative frequency in this type of case. According to Pardee a little less than a third of the cases of coronary thrombosis show a definite $Q_3$, and though its amplitude tends to lessen in the course of time, it is persistent and the continued presence of $Q_3$ with left axis deviation undoubtedly strengthens a diagnosis of past coronary infarction.†

CASE 7.—Male, aged 48. Keen, active healthy man attacked by severe coronary thrombosis on Dec. 17th, 1928. Preceded for 24 hours by prodromal pain in wrists and lower end of sternum—constant but varying. Feb. 28th, 1929 (two and a half months later) : an ache in right wrist if he hurries ; heart normal in size and sounds, but $M_1$+ ; B.P., 140 ; E.C.G., $T_3$ type, $Q_2$ and $Q_3$ marked (Fig. 6A). Jan. 19th, 1929 : improved ; B.P., 110/80 ; H.R., 80. Nov. 12th : B.P., 130/90 (Fig. 6B). Sept. 11th, 1930 : much improved ; B.P., 135/100 ; H.R., 68 ; still pain in right wrist on effort ; E.C.G., $T_3$ inversion less, $Q_2$ and $Q_3$ persist (Fig. 6c).

CASE 8.—Male, aged 65. Gives clear history of attack of C.T. 1930. Previous to this he was well and strong. Since the attack some tendency to effort angina, most

† Since the delivery of this address a valuable paper has appeared in Heart (1933, vol. xvi., Nos. 3 and 4), by F. N. Wilson et al., in which reference is made to the importance of a large $Q_1$ in the $T_1$ type, and of $Q_3$ in the $T_3$ type of coronary occlusion. Emphasis is laid upon the greater persistence of this evidence of occlusion as compared to that of the characteristic changes in the RS–T segment.

marked for the six months subsequent to the C.T. The record shows a persistent well-marked $Q_3$, and slight inversion of $T_3$ after three years (Fig. 7).

CASE 9.—Male, aged 57. June, 1926, when aged 50, a typical attack of C.T. Sept. 23rd, 1926: effort angina; heart not enlarged; X ray normal; B.P., 150/90; H.R., 84; E.C.G., $Q_3+$, $T_2$ slightly inverted, $Q_3++$, $T_3$ typical inversion. July 22nd, 1927: second attack; short duration of agonising pain with slight hæmoptysis; pain substernal and epigastric. July 6th, 1933: still slight liability to effort angina; general condition good; heart slightly enlarged; B.P., 185/100; E.C.G., $T_3$ iso-electric, $Q_3$ split and well marked, $Q_2$ present (Fig. 8).

During recovery after a cardiac thrombosis the inversion of T in lead I. or III. may gradually approach the iso-electric level or even return to the normal. More often there is a slight persistent inversion, and the significance of this is difficult to assess if one is ignorant of the previous changes, especially in lead III. Inversion of $T_3$ is no uncommon feature in normal hearts, and also in hearts showing a relative dominance of the right ventricle—right axis deviation—as in some cases of mitral stenosis.

The fact that inversion of T occurs in conditions other than coronary thrombosis is a constant source of difficulty when attempting to evaluate the diagnostic significance of a single electrocardiogram. The difficulty arises from several causes:—

1. In cases with marked left axis deviation it is not uncommon to find inversion of T in lead I., and since hyperpiesia is present in many patients who develop coronary thrombosis this combination is confusing. Also, in aortic stenosis and regurgitation the same tendency to inversion of $T_1$ is present, with a prolongation of Q R S. Such records may simulate early branch-bundle lesions with biphasic type of curve, but in the latter there is a

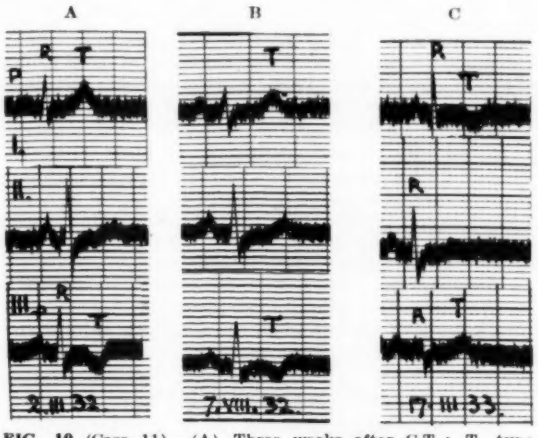



FIG. 10 (Case 11).—(A) Three weeks after C.T.; $T_3$ type. (B) Six months after C.T.; $T_3$ much less inverted. (C) Shift to $T_1$ type following further attacks of C.T.

tendency to splitting or slurring and broadening of the Q R S complex.

2. Inversion of T is present in certain disorders of metabolism, more particularly in diabetes and cases of hypothyroidism, though it hardly conforms to the characteristic form of inversion found in coronary infarction.

3. Less likely to cause confusion are patients suffering from pneumonia and toxic states, such as uræmia, where inversion of T has been noted. Digitalis gives its own characteristic inversion.

4. Another possible cause of inversion in $T_3$ is to be found in a high placed diaphragm.

One other point should be mentioned. Slowly progressive narrowing of a coronary artery is known to give rise to an ischæmia fibrosis and this, as one would expect, may cause a change in the electrocardiogram which is not unlike that resulting from coronary infarction. In such patients there is a

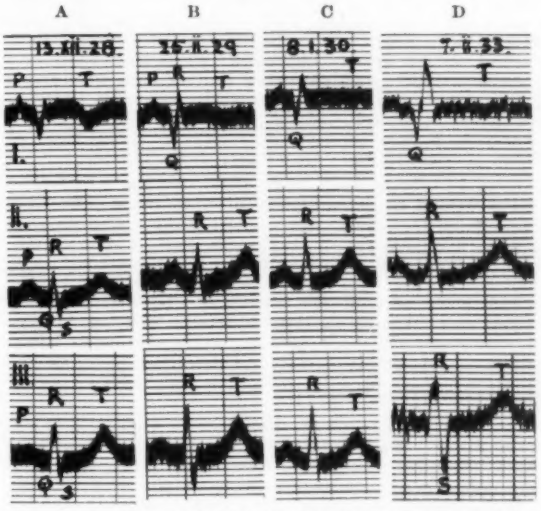



FIG. 11 (Case 12).—(A) Forty-six days after C.T.: $T_3$ type; low voltage. (B) Two and a half months after C.T.: $T_3$ flattening; low voltage. (C) Fourteen and a half months after C.T.: $T_1$ iso-electric. (D) Four years and three months after C.T.: $T_1$ still iso-electric; voltage remains poor; Q R S spread. In A, B, C, D, Q is present.

stability and permanence in the inversion in contrast to the variations usually noted in the inversions due to infarct.

I have already referred to the presence of "silent areas" in the heart, giving no indication by the ordinary conventional leads of the existence of coronary infarction. Wolferth and Wood [26] have stressed that these areas are no longer "silent" if appropriate leads are used. They apply Lewis's electrodes to the front and back of the chest, the right wire attached to the anterior electrode, the left to the posterior. This lead they term lead IV. They pointed out to me that in lead IV. the Q deflection is deep and well marked in normal hearts, but in coronary thrombosis of the $T_3$ type in addition to definite changes in the iso-electric level of RS–T the Q deflection diminishes or disappears, and this feature tends to persist. This may prove to be a sign of value when the three orthodox leads fail to give decisive information.‡

The following brief records are given as exemplifying some of the points to which I have already referred. Their interest lies in the changes which tend to persist.

CASE 10.—Male, aged 65. Coronary thrombosis simulating "acute abdomen" perforation. $T_3$ inversion after 11 months. Prodromal "suffocating feeling in chest and neck." Three days later sudden agonising pain in epigastrium; restive; surgeon refused operation; gave morphia. Seen with Dr. Wallace Jones, Heart Clinic, May 11th, 1932 (Fig. 9A). March 17th, 1933 (11 months after C.T.): still slight inversion of $T_1$ (Fig. 9B); heart slightly enlarged; no bruits; $A_2+$; B.P., 170/120; H.R., 80; arteries very tortuous; slight dyspnœa on exertion.

CASE 11.—Male, aged 61. March, 1930: attack of "influenza"; ill seven weeks. Since then moderate

‡ In the *American Heart Journal*, June, 1933, p. 595, Katz and Kissin have an interesting paper in which they deal with lead IV. in coronary occlusion.

angina of effort. Heart normal in size, slight arteriosclerosis, no bruits; B.P. normal. Worked as a bricklayer until first week in February, 1932. End of first week in February, 1932: history suggestive of mild coronary thrombosis; severe pain three-quarters of an hour, with dyspnœa; subsequently anginal pain more easily induced. March 2nd, 1932: E.C.G., $T_3$ type (Fig. 10A). August 7th: $T_3$ less inverted (Fig. 10B); cardiac reserve greatly improved. Christmas, 1932, and February, 1933: sudden severe anginal pain with angor animi, unrelieved by amyl nitrite; on each occasion awakened by attack. March 17th, 1933: E.C.G. shows change to $T_1$ type with low voltage (Fig. 10C); heart as before, normal in size; no bruits; B.P., 125/85.

CASE 12.—Male, aged 66 in 1928. To show flattening out of $T_1$ and persistence of $Q_3$ after 4½ years. Coronary thrombosis, Oct. 28th, 1928; onset "like a ship striking a rock in a calm sea." Had never been ill, and no discomfort of any kind on exertion. Pyrexia for six days, 100° to 101° F.; pericardial rub at end of 24 hours; vomiting on and off for two days. Dec. 13th, 1928: better, no further pain; heart normal in size; no bruits; $M_1$ doubled; B.P., 130/85 (Fig. 11A). January, 1930: began to practise (Fig. 11C). February, 1933: steady improvement; can take gradients that used to worry him; B.P., 125/70 (Fig. 11D).

CASE 13.—Male, aged 55, shopkeeper. Always vigorous, healthy man. Father died in anginal attack. Attack of severe coronary thrombosis, Oct. 25th, 1932; agonising pain, seven hours, resistant to morphia and amyl nitrite; collapse, nausea, vomiting. Nov. 10th, 1932: no valvular disease of heart; arteries healthy; B.P., 110/75; advised bed for another month. March 20th, 1933: feels well, occasional slight tightness across chest on effort; heart sounds short, no bruits; B.P., 115/80. E.C.G. (five months after attack): iso-electric T in lead I.; Q R S broadened and slurred; left axis deviation (Fig. 2A).

CASE 14.—Male, aged 48, newsagent. Towards end of August, 1932, while sitting in tramcar, sudden agonising pain, substernal; apprehensive, restless, and agitated. Duration 24 hours. Subsequently felt ill and exhausted,

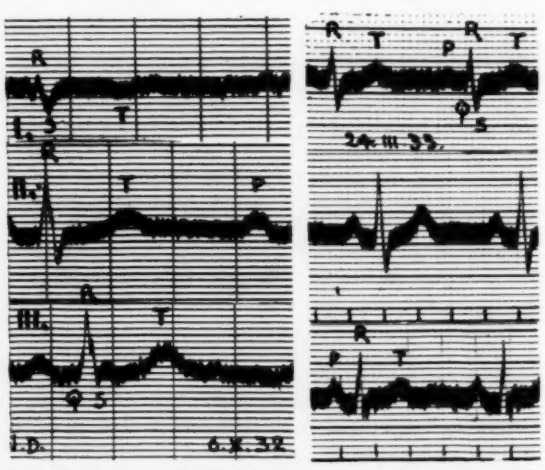



FIG. 12 (Case 14).—(A) Within two weeks of C.T.; $T_1$ type; slight inversion of T; Q R S abnormal. (B) Seven months after C.T.; nothing to indicate previous damage.

and effort angina easily induced with pain spreading down inner side of left arm. Oct. 6th, 1932: size of heart difficult to define; not enlarged; no bruits; heart sounds faint; B.P., 115/75; E.C.G., Q R S abnormal, $T_1$ slightly inverted (Fig. 12A). March 24th, 1933: looks well; is back to work; E.C.G., $T_1$ normal; nothing to indicate previous thrombosis (Fig. 12B).

CASE 15.—In October, 1925, when the patient was 55 years old, he began to suffer from effort angina. E.C.G. was normal with left axis deviation; B.P., 120/80; cardiac thrust 5 in. out. Feb. 20th, 1928: sudden agonising pain, spontaneous; duration of at least five hours, probably first attack of coronary thrombosis. Diminished cardiac reserve since then. Nov. 8th, 1931: attack of coronary thrombosis; onset when in bed;

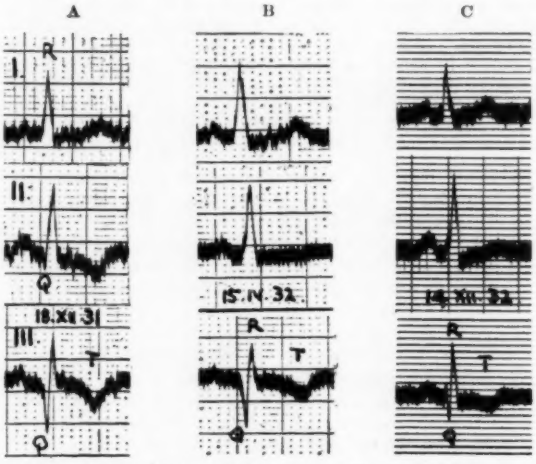



FIG. 13 (Case 15).—(A) Forty days after second attack of C.T.; $T_3$ type, $Q_3$ pronounced. (B) Five months after attack of C.T.; $T_3$ less inverted, $Q_3$ pronounced. (C) Thirteen months after attack of C.T.; $T_3$ only slightly inverted, $Q_3$ persisting.

heart sounds distant; slight pyrexia. Under care of Dr. W. Jones. B.P., 140/80. Dec. 18th, 1931: E.C.G., $T_3$ type, $Q_3+$ (Fig. 13A). April 15th, 1932: increased liability to angina of effort; E.C.G., $T_3$ less inverted, $Q_3+$ (Fig. 13B). Oct. 26th, 1932: more dyspnœic; pain on walking; B.P., 125/90. Dec. 14th, 1932: increasing liability to severe nocturnal dyspnœa; great distress; no pain; heart enlarged, sounds distant, no bruits; B.P., 120/85; definite pulsus alternans. E.C.G. (13 months after last C.T.) as before, $Q_3+$ and $T_3$ still slightly inverted (Fig. 13C). Jan. 2nd, 1933: attack of coronary thrombosis; dyspnœa and collapse the dominant features, with pyrexia. Death Jan. 14th, 1933.

In reviewing the position it is clear that the diagnosis of a minimal or aberrant type of coronary thrombosis is one based primarily on clinical grounds. I venture to say that this cannot be over-emphasised; a diagnosis dependent indeed on the care and intelligence with which the examination, and more particularly the cross-examination, of the patient is carried out. Occasionally the electrocardiogram may give a decisive answer when the diagnosis is in doubt. More frequently it does no more than afford additional support.

## History of Graphic Methods

The history of the part played by graphic methods in the elucidation of cardiac problems is of interest and certain dates are noteworthy.

It was in 1902 that Mackenzie published "The Study of the Pulse," to be followed in 1904 by Wenckebach's "Arrhythmia of the Heart." These pioneers laid the foundation on which modern cardiology is built. Their analysis of the arrhythmias was masterly. Mackenzie utilised records of the jugular pulse as the key to the problem, Wenckebach relied largely on a careful analysis of cardiograms and radial sphygmograms.

It was not until 1909, however, that the specific nature of auricular fibrillation was demonstrated by Sir Thomas Lewis.[27] This demonstration was made possible or at any rate greatly facilitated by the string galvanometer. The case for the specific nature of auricular fibrillation was presented lucidly

and in more detail by Lewis in 1910 and from that date has been recognised as a clinical entity. In 1911 the first edition of "The Mechanism of the Heart Beat"[28] appeared, since when the string galvanometer has played an increasing part in the practice of medicine. With the introduction of the galvanometer there followed a period of intensive investigation of all forms of abnormal rhythms with the result that the clinical picture of these vagaries became so sharply defined that it was possible in most instances to make an accurate diagnosis without resort to the galvanometer. In a sense the electrocardiogram, so far as the arrhythmias are concerned, had played its part as an instrument of precision. Subsequently for some years, apart from research work, the electrocardiograph was employed clinically for teaching purposes and in the investigation of the less obvious and rarer forms of cardiac disorders.

A new era began with the recognition of the peculiar and specific changes in the electrocardiogram associated with coronary infarction. Attention was increasingly focused on the myocardium and on lesions of the coronary arteries. This has stimulated further research and the electrocardiograph has proved its value in the investigation and determination of the integrity of the myocardium. It was clear that in it we possessed an instrument which could help in assessing the degree of the myocardial damage and recording the phases of recovery. With its aid the diagnosis of a typical case of coronary thrombosis has been placed on a sure basis and we are now in a position comparable to that in regard to the arrhythmias in which an electrocardiogram has become almost redundant.

Unfortunately this stage has not yet been reached in the atypical and aberrant forms. Here we are still dependent on the machine for diagnosis and corroboration. Nevertheless, even in this more obscure field, knowledge is growing, facts are being accumulated, and the electrocardiograph is steadily guiding us to a clearer conception of the clinical results of coronary disease.

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# DEVELOPMENTAL MYOPIA AND THE TREATMENT OF MYOPES


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THE state of static refraction of an eye is the result of the integration of a large number of variables. In most text-books too much stress is laid upon the length of the eye. It has been shown by actual measurements that the length of the emmetropic eye may vary by as much as 2 mm., and the radius of curvature of the cornea from 7 to 8·5 mm. Compensating factors are the curvatures of the refracting surfaces, the indices of refraction of the media, and the position of the lens. As an example, a buphthalmic eye may be as much as 31 mm. in length from the anterior surface of the cornea to the retina, and yet not be myopic. Myopia may be due theoretically to any of the following conditions:—

1. Abnormally increased length of the eye (*axial myopia*).
2. Abnormal curvature of the refracting surfaces (*curvature myopia*): (*a*) too strong curvature of the cornea; (*b*) too strong curvature of one or both surfaces of the lens.
3. Abnormal refractive indices of the media (*index myopia*): (*a*) too high index of the cornea or aqueous; (*b*) too high total index of the lens, due to too high index of the nucleus or too low index of the cortex; (*c*) too low index of the vitreous.
4. Displacement forwards of the lens.
5. A combination of the above factors.

The development of the eye is such that the normal baby is born with hypermetropic eyes. During the first years of life the various factors change in such a manner that the eye becomes less hypermetropic and may become perfectly emmetropic. Statistics of the incidence of emmetropia and ametropia at different ages are very unsatisfactory owing to several reasons. The estimates of different observers are not always reliable or strictly comparable; but the chief source of ambiguity is the valuation for statistical purposes which should be allotted to various degrees of astigmatism. From the statistical point of view, however, the generalisation that the normal eye is hypermetropic at birth and tends constantly during the early years of life towards a condition of diminished hypermetropia may be regarded as true.

## THE NORMAL AND THE IDEAL NORMAL

The statistical investigation of any variable commences with the determination of its frequency distribution. Thus, if in an adult male population the numbers of individuals are plotted against their heights, a "cocked hat" curve is obtained which almost exactly coincides with the theoretical ideal symmetrical frequency-distribution curve. In such a curve the criterion of absolute normality is given by the maximum ordinate, but slight differences on each side of the maximum cannot be regarded as pathologically abnormal. In very many biological and other examples—e.g., the weight of adult males—the distribution curve is asymmetrical or skew, the greater frequencies lying towards one or other end of the range. Owing to the higher incidence of hypermetropes at birth we should expect the frequency

distribution of variations in refraction to present such a skew deviation curve.

In all such "populations" large numbers of individuals approximate nearly to the statistical ideal normal as judged by the maximum ordinate of the frequency curve. Apart from the statistical examination there is often no more reason for regarding these as less normal than the ideal normal. In the case of the refraction of the eye, on the other hand, the normal has not been arrived at by statistical methods, but by quite other considerations. Emmetropia is the condition in which parallel rays are brought to a focus on the retina; optically considered, it is an ideal normal. Moreover, it is one to which large numbers of individuals conform, and which must therefore deviate little from the statistical normal. The cases are rare in which nature attains the optimum invariably, as in the angle of the honeycomb cell; and emmetropia is certainly not one of these cases.

Owing to the prolonged immaturity of the young of primates, and especially man, the teleological argument would lead one to expect that human vision is specially adapted to the requirements of early and middle adult life. During this period accommodation is active, and the moderate hypermetrope is at least as well adapted to everyday life as the emmetrope. The fact that practically all mammals are hypermetropic would lead one to expect that their statistical ideal normal is definitely hypermetropic, and it would seem that in man the frequency curve has shifted towards the emmetropic condition. Too much stress cannot, however, be placed on this argument, owing to the absence of a fovea in lower mammals and the differences in their vision and mode of life. It would be interesting to know whether the lower primates are ever emmetropic or myopic.

In any case it would seem certain that from the biological point of view we should expect to find many examples of permanent low hypermetropia, and a few—but perhaps not negligible—examples of permanent low myopia. Such cases are fundamentally no more pathologically abnormal than short men or tall men. My own experience, chiefly derived from private cases carefully watched over a number of years, is that cases of "stationary" myopia conforming to this hypothesis are not very uncommon. One meets with children with very low degrees of myopia which increase up to a maximum of 1 or 2 dioptres during the growing period, and then remain quite stationary. As a rule their fundi are perfectly normal, and there are no myopic crescents. Of course it is impossible to be certain that any such child belongs to this group of "developmental myopia," since every progressive myope must pass through the stage of low myopia. Certainly some such cases remain stationary for many years.

## VISUAL CAPACITY

If, as suggested above, there has been a tendency in the mammalia for the maximum of the frequency curve to shift towards low hypermetropia or emmetropia, some enhancement of this tendency might be anticipated as the result of civilised conditions. If so, it would not be surprising for cases of low myopia to occur from this cause. Important as perfect visual acuity is, I am of opinion that its value is not infrequently over-estimated. A man's visual efficiency depends not only on his visual acuity, but also upon his field of vision, rapidity of accommodation and adaptation, and many other factors which can be conveniently summed up in the term *visual capacity*.[1] Even when a man's visual capacity has diminished his working efficiency for his job may be little impaired, owing to the compensating effects of acquired technical skill. This fact was conclusively proved in certain cases by an investigation carried out by the Committee on the Physiology of Vision of the Medical Research Council for the Royal Navy. It is a well-known fact that a good game shot remains good long after his visual capacity has materially declined.

## MYOPIA AND NEAR WORK

It is a remarkable fact that the eye, which can scarcely be regarded as having been evolved for the express purpose of adaptation to the needs of civilised life, is yet capable of fulfilling them with relatively little detriment or even discomfort. There are, indeed, many occupations in which a low degree of myopia, per se, is a real asset. If there are cases of "stationary" myopia such as I have suggested, they are eminently suited for such occupations, since there is no reason to suppose that they would suffer in any way. I think the evidence is in favour of the view that degrees of myopia (e.g., of 4 or 5 D), which I have not ventured to include in the above category, may yet suffer no detriment whatever from a considerable amount of near work. The natural and quite justifiable dread of the evil effects of near work on myopia has, in my opinion, led some ophthalmic surgeons to undue pessimism, and in some cases to serious and unnecessary interference with children's education. I have had cases of children of 11 or 12 years of age, with 3 or 4 dioptres of myopia, whose parents have been warned of the direst consequences unless they take the children away from school for two or more years and practically allow them to do no near work. In my opinion in most cases of low myopia a reasonable amount of near work, carried out under the best conditions and with proper precautions as to correction of refractive errors (especially astigmatism), good lighting, proper working distance, and strict attention to general health, does no harm at all. It is even doubtful whether it has any appreciable effect in increasing the rate of development in cases which are truly progressive. Nevertheless, of course each case must be periodically examined at short intervals and near work restricted if increase is at all rapid.

So far as the eyes themselves and vision are concerned no deleterious consequences are likely to accrue even if cases of developmental myopia are not corrected at all. Such patients may get headaches, &c., if there is anisometropia or astigmatism, but not if both eyes have the same amount of myopia, and there is no astigmatism. I think the same applies to cases of low myopia which more doubtfully belong to the developmental and stationary group. I regard it, however, as of the greatest importance that these children should wear their distance corrections, and wear them constantly—not specially in the interests of their eyes, but in the interests of their mental development. For children with even low degrees of uncorrected myopia cannot be expected to take a normal interest in their surroundings since they cannot see distant objects as clearly as their fellows. Their mental horizon is constricted, they tend to become unduly introspective, and they are thrown more and more into finding their interest in reading and near work, so that it becomes more difficult than ever to restrict such work.

[1] See Brit. Med. Jour., 1928, ii., 205; Fergus, Freeland: ibid., 1928, ii., 287.

Many patients with moderate degrees of myopia are perfectly happy when using their distance corrections for all purposes. They are thus placed as nearly as possible in the condition of emmetropes. But this does not apply to all cases, especially if the patients are engaged—as many are, and must be—in prolonged near work. In these cases they are much happier with a weaker correction for near work.

The treatment for patients with high degrees of myopia has been the subject of much thought and care, and great advances have been made in recent years. The establishment of "myope" classes has undoubtedly been a step in the right direction and has had an undeniably beneficial effect. At the same time it has been by no means free from the enthusiasm which outruns discretion. Many of these patients are advised to adopt a régime and mode of life which is as ill-judged as to advise a poor patient to winter on the Riviera. Are we really quite so certain of the data upon which we found our counsels of perfection as we think we are? I think that in cases of progressive myopia the evidence is overwhelming that near work, especially when prolonged or carried out under unsatisfactory conditions, tends to aggravate the disease—for these are cases of disease, therein differing from what I have called developmental myopia. I am entirely in support of the principles underlying the methods adopted in myope classes, but I am also convinced that in many cases lack of judgment is shown in pushing these principles to their logical conclusion. We have to face the fact that many high myopes are condemned, ipso facto, to spend much or most of their working hours doing near work, and we cannot deny that in many respects they are specially adapted to perform this type of work. Moreover, large numbers do so for many years without disaster. Many such cases settle down in early adult life to a degree of myopia—often indeed of high degree—which shows little or steadily diminishing rate of increase. Each case must be considered on its merits (or demerits), general health, social status, and occupational opportunities must be evaluated, and a sane compromise arrived at which errs neither on the side of idealism nor recklessness.

## CLINICAL MANIFESTATIONS OF PULMONARY TUBERCULOSIS IN CHILDHOOD

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(WITH ILLUSTRATIONS ON PLATE)

PHTHISIS is one of the rarest of the diseases of childhood, and as it is improbable that the disease was ever common in the early years of life it is not very easy to understand the fear of consumption in childhood, which still prevails among the laity and even to some extent in the profession. The pathos of consumption in adolescence has been fully exploited by novelists, but even the Victorian writer, who did not scruple to employ the death-bed of a child as a means to evoke the flow of tears upon which his income depended, was obliged to find some other means than consumption when disposing of his child victims. Disobedient children might be poisoned with deadly nightshade or gored by mad bulls, children too good for this world might succumb to fevers or simply fade away, but their little nightshirts were never stained with the "blood-red spots" which bespattered the "glittering fan" of Ethel Churchill.[1] If consumption had been at all common in childhood a century ago, Little Nell and Paul Dombey need not have declined in so unscientific a manner. Improved methods of diagnosis have enabled us to recognise many forms of pulmonary tuberculosis in childhood previously unknown, but it has only confirmed clinical and lay observation in proving the rarity of phthisis in the early years of life.

### RARITY OF OTHER FORMS OF PULMONARY TUBERCULOSIS IN CHILDHOOD

It is often assumed that though phthisis in childhood may be rare, milder manifestations of pulmonary tuberculosis are common, and that by the early recognition of certain stigmata which indicate incipient disease, graver developments may be precluded. We are asked to believe that adolescent phthisis can be prevented by the adequate treatment of children who have been quaintly described as pretuberculous. This is not so. Pulmonary tuberculosis is not often the cause of delicacy in childhood in this country. The most meticulous examination of the delicate child will rarely reveal any evidence of tuberculosis save that supplied by a positive reaction to skin tests, a reaction which merely proves that the child has been the subject of a primary infection, and that its tissues are hypersensitive to tuberculin. We do not even know whether allergy implies increased susceptibility, relative immunity, or neither. A "follow-up" of child "suspects" through the danger years of adolescence would probably show a percentage of tuberculosis, little, if any, greater than might be found in a "non-suspect" group drawn from the same social class and circumstance. There is no definite evidence that primary infections which do not produce demonstrable lesions have any ill-effect upon a child's health. But though pulmonary tuberculosis is uncommon in childhood, the disease cannot be relegated to the class of medical curiosities. Failure to recognise it may be attended with disastrous consequences, and a knowledge of its varieties and of the evidence upon which a correct diagnosis depends is essential if needless fears are to be allayed or incipient disease arrested.

### PARAMOUNT IMPORTANCE OF RADIOLOGY IN DIAGNOSIS

In diagnosis we have to depend almost entirely on the X ray picture of the chest. Symptoms are not distinctive. The history of coughs, malaise, and malnutrition are frequently given when a delicate child is brought for examination. They may even be due to a digestive disturbance wholly unconnected with the lungs. Sweating, a symptom of no diagnostic significance, is the one to which maternal solicitude generally attaches chief importance—a curious reminder how short a time separates us from the days when a complete absence of bedroom ventilation was responsible for drenching sweats in dying consumptives. Physical signs are notoriously unreliable in the examination of tuberculous patients, and in childhood they are perhaps even less helpful than they are in later years. Thus X ray examination of the chest should be made whenever a history of contact with infection suggests that delicacy may be associated with a tuberculous infection, and to exclude the possibility of such an infection when no other cause for a persistent malaise is apparent.

### A SIMPLE CLINICAL CLASSIFICATION

If we exclude those cases in which X ray examination reveals calcified foci in the lung fields and calcified nodes at the lung roots, evidence of arrested and healed infection often found in routine examination of the chests of children in good health, we can recognise six varieties of pulmonary tuberculosis, three of comparatively benign and three of serious import.

*Benign group.*—(1) Tuberculous adenitis and "epituberculous" manifestations. (2) Chronic miliary tuberculosis. (3) Tuberculous pleurisy with effusion.

*Serious group.*—(1) Acute miliary tuberculosis. (2) Tuberculous pneumonia. (3) Adult type of phthisis.

### DIAGRAMMATIC REPRESENTATION OF PATHOLOGICAL CHANGES

It may help us to appreciate the meaning of the facts observed at the bedside and the changes seen in chest radiograms if we attempt a diagrammatic representation of the changes that follow infection. It is obvious that such a scheme will not accurately represent pathological processes, but it may help to clarify our ideas as to the kind of developments which follow infection.

(1) Our starting point must be the "primary complex." Here we are on fairly sure ground. When tubercle bacilli are first deposited in the lung a nidus is formed, from which infection travels up the lymph channels through the subsidiary lymphatic nodes to the root glands. The pathological evidence for this is secure and radiological evidence confirms it, for after healing has occurred deposits of calcium enable us to see the primary focus as a minute shadow often situated subpleurally, a slight accentuation of the normal lymph-vascular striations, and a core of calcium in the nearest hilar glands.

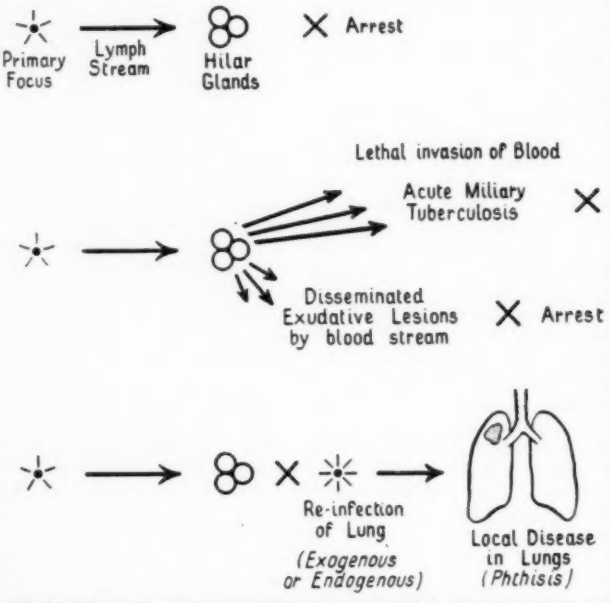



**DIAGRAM 1.**—Diagrammatic representation of the probable course of events following primary infection.

(2) The disease, or perhaps we should rather say the process, for primary infections are generally unaccompanied by evidence of disease, usually comes to an end with the arrest of tubercle bacilli in the root glands. Further developments may however ensue and result in a series of pathological changes which are characteristic of juvenile tuberculosis. Most of these are of an exudative nature and will be discussed later. Here we need only note their widespread distribution which leads us to conclude that the lymphatic infection is followed by a blood infection. This may take the form of a tuberculous bacillæmia leading to death within two or three weeks, or to more or less benign inflammations in pleura, parenchyma, or joints, usually followed by recovery. As the lymphatic system is in direct communication with the blood stream the manner in which lymphatic infection may lead to a tuberculous bacillæmia is easy to understand. Dr. R. Pearce has made the ingenious suggestion that a direct ulceration of the wall of a blood-vessel by a caseating primary focus might account for acute miliary tuberculosis, while the passage of bacilli into the blood stream from an infected gland might account for the less serious manifestations of a blood-borne infection. It is noteworthy that when he was endeavouring to recover tubercle bacilli from the blood in a series of tuberculous patients he only obtained two positive results, one in a case of acute miliary tuberculosis, the other in one of chronic miliary tuberculosis. The latter, as will be seen presently, is one of the relatively benign types. Our scheme must evidently take cognisance of this systemic inundation.

(3) The adult type of tuberculosis differs from the juvenile. It is in the main a local disease which spreads by continuity, and as a rule only involves distant organs by accidental infection, as when bacilli are swept upwards by the ciliary action of the bronchial lining and deposited in the interarytenoid region of the larynx, or when they are swallowed and find a suitable nidus for development in the intestinal mucosa. The general dissemination by the blood stream, apparently common in the juvenile types, only occurs as a terminal event in a small proportion of adult cases.

In the scheme (see Diagram 1) the *first* figure represents invasion followed by arrest, the *second* invasion followed by dissemination throughout the blood stream, the *third* represents the result of primary infection successfully overcome but followed by reinfection (endogenous or exogenous) and local disease in the lungs of adult type.

It will be remembered that Ranke drew an analogy between the three stages of syphilis and the three stages of tuberculosis. Such an analogy is helpful in emphasising the fact that in tubercle as in syphilis there is a stage of primary infection, a stage of dissemination, a stage of localised disease, but we have only to consider the generalised tuberculosis which often terminates the course of chronic phthisis to realise that exceptions occur.

### BENIGN FORMS OF PULMONARY TUBERCULOSIS IN CHILDHOOD

(1) *Tuberculous adenitis of mediastinal glands and associated conditions.*—Active tuberculous adenitis is only visible in radiograms when the glands are either calcified or so grossly enlarged that their outer margins project beyond the mediastinal shadows (Fig. I. on Plate). The association of parenchymatous or pleural exudation with glandular enlargement is frequent and causes characteristic shadows in the skiagram. Such exudative areas in the lung fields

are represented by uniform semi-translucent opacities, the edges of which are blurred. The absence of the coarse mottling associated with broncho-pneumonia and of the striations and granular stippling associated with fibrosis is to be noted. The characteristic shadow of pulmonary exudation in the vicinity of the root glands is seen as a triangular opacity based on the hilum and tapering towards the axilla (Fig. II. on Plate). It is often flame-shaped. Such a "hilum flare" must be due either to a perifocal reaction around the tuberculous glands, to a similar reaction among tubercles situated in the vicinity of the glands, or to lymphatic obstruction of the vessels converging on the lung root by glandular enlargement. An interlobar pleurisy, especially on the right side where the plane of the interlobar fissure between upper and middle lobes is nearly tangential to the rays, may produce a similar triangular shadow, but in this case its lower margin is clean-cut and runs more or less horizontally outwards (Fig. I. on Plate). An interlobar pleurisy, parenchymatous exudation, and adenitis may be combined. More often inflammation of the root glands is associated with effusion between the two layers of the parietal pleura.

The condition which has been termed epituberculosis appears to be related to that just described, for the shadows of a healing epituberculosis closely resemble a hilum flare, while I have seen a case in which an extension of a flare resulted in a picture indistinguishable from that of epituberculosis. The two conditions well exemplify the "ebb and flow" which is typical of the exudative lesions of juvenile tuberculosis (Fig. IV. on Plate).

In "epituberculosis" the physical signs are those of a lobar consolidation which usually involves the right upper lobe, but it differs from a pneumonia in onset, which is seldom accompanied by symptoms of acute disease and which may be entirely "latent" in its course, which is chronic, and in its resolution, which takes place as a slow clearing from the periphery. There is no respiratory distress, and neither the fine crepitations of incipient nor the coarse crepitations of resolving pneumonia are heard. There is usually a history of exposure to the risks of massive infection by contact with a phthisical parent. Skin tests are strongly positive, and a complement-fixation test for tuberculosis may also give a positive result. Tubercle bacilli have been recovered from stomach washings and by exploratory puncture of the lung. The clinical picture is thus that of a curiously benign pneumonia in a tubercle-infected child which persists for a period of several weeks or even months and which resolves leaving either a perfectly healthy lung, or in some instances some slight evidence of parenchymatous scarring (Fig. III. on Plate).

The pathological basis of "epituberculosis" has been much debated. Elias and Neuland,[2] to whom the credit of its first description is due, regarded it as evidence of a non-specific response around a specific (i.e., tuberculous) focus. When a Mantoux test is made on a child in whom a high degree of allergy has resulted from primary infection a large weal forms, due to the outpouring of exudate into the tissues surrounding the point of inoculation. It is not unreasonable to suppose that a more widespread flooding of air cells and areolar tissue may take place in the pulmonary tissue as a response to the deposit of tubercle bacilli in the lung. The exudative response to specific irritation in the subjects of urticaria, hay-fever, and asthma furnishes an analogy. An alternative explanation is that the X ray appearances represent a lobar atelectasis, due to the compression of a main bronchus by an enlarged gland. In cases of epituberculosis enlarged root glands are often seen in either antero-posterior or lateral films. In some instances the appearances seen in epituberculosis are indistinguishable from those seen in atelectasis. In addition to the lobar opacity the interlobar septum may be drawn upwards, proving a measure of retraction of the lobe. Scott Pinchin and Morlock[3] have recently described such a case in which bronchoscopy proved that a tuberculous gland was compressing and ulcerating the bronchial wall. Removal of the obstructing material was followed by a rapid clearing of the opacity in the lung field. It should be noted, however, that in many cases there is no evidence of any gross enlargement of the root glands, that the hilum flare which is evidently an analogous condition cannot be due to pulmonary collapse, and that though some enlargement of the root glands accompanies the parenchymatous exudation it does not necessarily follow that one is the effect of the other, for the two phenomena may result from the reaction of different tissues to the same stimulus. Adenitis is almost invariable in juvenile tuberculosis.

The results of the few post-mortem examinations that have been made are conflicting and it would be wiser to suspend judgment until further evidence is forthcoming. It is evident that some cases resembling epituberculosis are due to atelectasis. It is probable that other factors are at work in other cases.

(2) *Tuberculous pleurisy with effusion.*—The onset of pleurisy in the adult is usually accompanied by severe pain and pyrexia, which only subside when effusion has occurred. The tuberculous pleural effusions of childhood seldom cause much distress, and the presence of fluid may only be discovered in the course of a routine examination of a child "contact." Thus, though in adults a tuberculous pleurisy implies an active inflammation, in childhood we seem to be dealing rather with an exudation analogous to the pulmonary exudations just considered.

(3) *Chronic miliary tuberculosis.*—One of the surprises sprung by radiography on the unsuspecting phthisiologist was the revelation of a non-fatal form of miliary tuberculosis (Figs. V. and VI. on Plate). Unaccompanied by symptoms of serious illness at onset or by physical signs of disease in the chest, healing spontaneously in some cases and in others progressing slowly to give rise to the signs of a destructive phthisis, radiology alone could supply evidence of the condition. The radiographic picture of the chronic miliary form resembles that of acute miliary tuberculosis, but is distinguished from it by the fact that the stippling of the lung fields is coarser. Careful inspection also reveals the fact that the individual opacity has a slightly blurred outline.

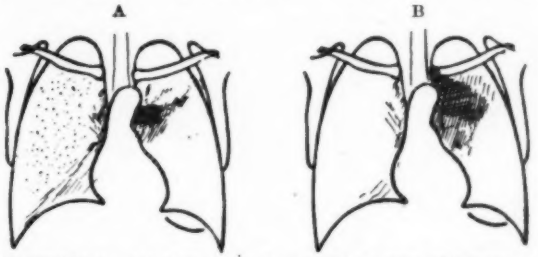



**DIAGRAM 2.**—(A) Boy, aged 12. Drawing from skiagram of Dec. 12th, 1932. Miliary stippling of right lung. "Hilum flare" on left. Tuberculous arthritis of right wrist. Contact of phthisical step-brother. Tubercle bacilli obtained from pus from wrist sinus. (B) Skiagram of May 17th, 1933. Clearing of stippling from the right side has been followed by development of an epituberculous shadow on the left.

In favourable conditions resolution occurs, often with surprising rapidity, and when resolution is complete no scarring is observed. Chronic miliary tuberculosis may be accompanied by "epituberculous" manifestations or by pleural effusion, and would thus appear to be one variety of the exudative phenomena common in childhood tuberculosis.

The difference between acute miliary tuberculosis and the chronic form may be tabulated as follows:—

| *Acute miliary* | *Chronic miliary* |
|---|---|
| (1) An acute illness usually terminating in death within two or three weeks of onset. | A chronic malaise followed by resolution and recovery or by the slow development of chronic phthisis. |
| (2) Progressive and rapid wasting. | The patient may be poorly nourished or plump. |
| (3) Physical signs in the lungs may be absent, but scattered fine crepitations are usually heard. | Physical signs are absent or those of a chronic catarrh. |
| (4) Cyanosis usually present and often a marked feature. | No cyanosis. |
| (5) Acute pyrexia. | Temperature normal or of subfebrile type. |
| (6) May be associated with meningitis. | Associated with enlargement of hilum glands and exudative phenomena as pleural effusion or epituberculous manifestations. |
| (7) X ray examination shows the typical "snow-storm" appearance. | Skiagrams show coarser stippling and less universal distribution in the lung fields. |
| (8) Skin reaction may be negative. | Skin reaction usually strongly positive. |

The close relationship between submiliary tuberculosis and epituberculosis is shown by the case of a boy aged 12 years. In this instance serial radiograms showed that while stippling due to disease with miliary distribution was clearing on the right side, an area of exudation in the left upper lobe was extending outwards from the mediastinum. Ultimately the X ray appearances of a typical epituberculosis was produced. The boy also suffered from a tuberculous arthritis of the wrist, and tubercle bacilli were demonstrated in pus from this source. (Diagram 2.)

### ACUTE FORMS OF PULMONARY TUBERCULOSIS IN CHILDHOOD

(1) *Acute miliary tuberculosis.*—This classical manifestation of pulmonary tuberculosis in childhood, though not a common cause of fatality in early life, is still responsible for many deaths. When we discover pulmonary tuberculosis in an adult it is frequently impossible to ascertain the source of infection, but no such difficulty should be encountered when determining the source of infection in the cases we are now considering. The child who is suffering from acute generalised tuberculosis must have been the subject of massive infection from some person in close contact and generally living under the same roof. This is a disease which is clearly preventable, and far more determined efforts should be made to remove young children from contact with phthisical adults. In the county of Essex, in the year ending June 30th, 1933, 34 deaths from tuberculous meningitis were notified in children under the age of 10 years. This represents a rate of 0·13 per 1000 living in this age-group. As the administrative area includes many of the densely populated urban areas of East London and the typical rural districts of East Anglia, it is evident that the disease no longer represents a serious menace to child life in this country, but it should represent no menace at all. Reference has already been made to the clinical condition, and further description here is unnecessary.

(2) *Acute tuberculous broncho-pneumonia.*—In symptoms and physical signs tuberculous broncho-pneumonia closely resembles the common type. A suspicion that Koch's bacillus may be responsible should be entertained when the course of a broncho-pneumonia is prolonged beyond a period of two or three weeks, when in the absence of any evidence of empyema remittent pyrexia persists, and when wasting and cyanosis are marked features. A history of exposure to infection is suggestive that a broncho-pneumonia may have a tuberculous origin. Confirmation of the diagnosis must be sought by sputum examination if there is expectoration. If no sputum is available the fæces should be examined for acid-fast bacilli. The tonsils may be swabbed or a laryngeal mirror held over the entrance to the glottis may excite coughing and enable a sample of bronchial secretion to be collected from its surface. Before death the symptoms of a steadily progressive decline terminating in symptoms of meningitis may make the diagnosis evident. X ray examination, if this is possible, does not distinguish between tuberculous and non-tuberculous pneumonias. The disease is usually but not invariably fatal, and I have seen one case which terminated in complete recovery.

(3) *Tuberculosis of adult type.*—Though extremely rare, phthisis does occasionally develop in early childhood (Figs. VII. and VIII. on Plate). At the present time I have a child of 6 years under my care who is receiving artificial pneumothorax treatment for phthisis of adult type, the first signs of which were evident at the age of 4 years. The disease is usually of a chronic type and thus has more affinity with the proliferative or fibrotic variety commonly met with in adults of middle age than with the more exudative and florid disease of adolescence and early adult life. Diagnosis depends upon physical signs which, owing to the early tendency to fibrosis, can

### LEGENDS TO ILLUSTRATIONS ON SPECIAL PLATE

FIG. I.—Boy, aged 7. Contact of phthisical father. Large tracheobronchial gland on right side (left of skiagram) with triangular shadow due to interlobar pleurisy.

FIG. II.—Girl, aged 9. Contact of sister who died of consumption in 1930. Note calcified focus in left second intercostal space, and "hilum flare."

FIG. III.—Boy, aged 6. Epituberculosis in which resolution, with peripheral clearing, has begun.

FIG. IV.—Boy, aged 4. History of contact doubtful. Mantoux 1 : 100 +++ (Great Ormond-street Hospital). Note that the shadow on the right side is intermediate in type between the peri-hilum flare and the massive lobar involvement of the typical "epituberculosis" shadow. A year later resolution was nearly complete.

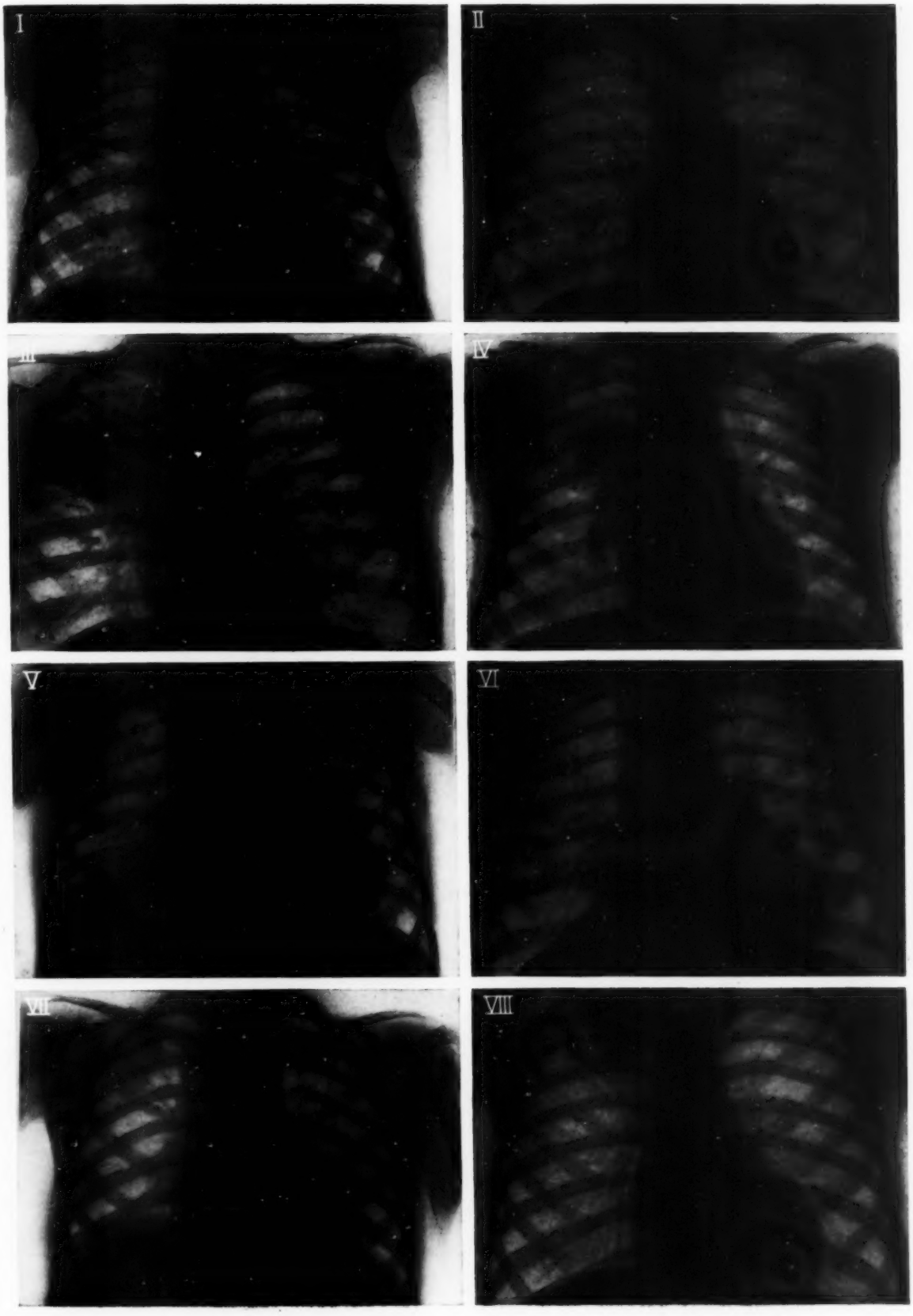
FIG. V.—Girl, aged 4. Skiagram of August 3rd, 1931. Diffuse stippling of both lungs due to miliary tuberculosis (chronic type). Note also the gross enlargement of the right tracheobronchial glands and the evidence of pleurisy at the right base. Tubercle bacilli were recovered from a sinus arising from a caseating cervical gland.

FIG. VI.—Skiagram from same patient, dated April 3rd, 1933. Complete recovery from all the lesions.

FIG. VII.—Boy, aged 4. Skiagram of July 2nd, 1930. Contact of phthisical brother who died at the age of 16 in 1931. Note rounded opacity in first right interlobar space, due to incipient pulmonary tuberculosis of adult type.

FIG. VIII.—The same case. Skiagram of Oct. 27th, 1931. A cavity has developed in the right subapical region.

# DR. BURTON WOOD: PULMONARY TUBERCULOSIS IN CHILDHOOD



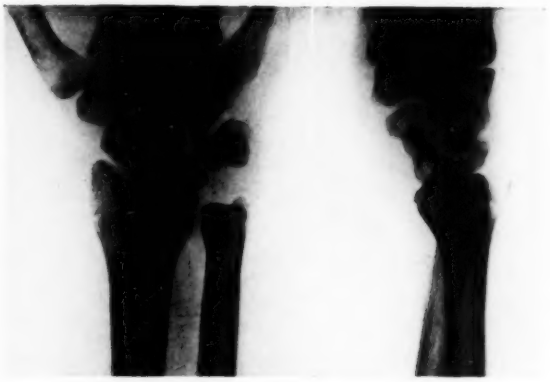
## MR. J. K. MONRO: DISLOCATION OF THE SEMILUNAR BONE

FIG. I

A B

Eleven days after accident.

FIG. II



A B

Thirty-one days after accident.

Radiograms from the case described in the text.

FIG III

A B

On day of accident.

FIG. IV

A B

Eight months later.

Radiograms from a case with fracture of the scaphoid in addition to dislocation of the joint between the semilunar and the os magnum.

## PROF. BLAIR AND DR. DAVIES: INFRA-RED PLATES IN NEUROHISTOLOGICAL ILLUSTRATION

FIG. I

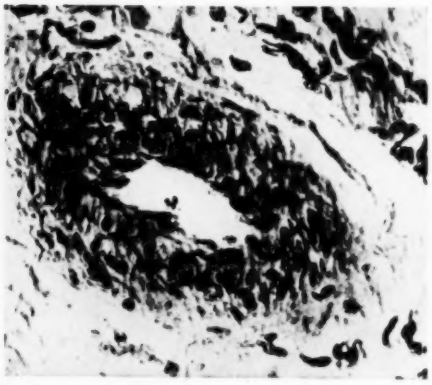


FIG. II

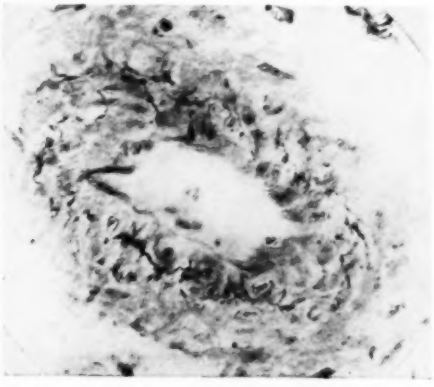


FIG. I. Transverse section of small branch of coronary artery in left limb of bundle of His, cow heart. × 450. Panchromatic plate.

FIG. II. The same preparation photographed on infra-red plate. × 500. For explanation see text.

generally be elicited except in the earliest stages. As in adult phthisis the disease usually commences in the subapical region. It should be remembered, however, that scarring of an upper lobe occasionally follows a broncho-pneumonia, and a diagnosis of phthisis should never be made unless X ray examination or bacteriology supply unequivocal evidence of of the disease.

My thanks are due to Dr. J. V. Sparks, of the radiological department of the Victoria Park Chest Hospital, and to Dr. M. C. Wilkinson, medical superintendent of the Black Notley Sanatorium, for their helpful coöperation. I have also to thank Dr. Pearce, of the pathological department of the former institution, for valuable criticism, and Dr. W. A. Bullough, county medical officer for Essex, for his constant support of the sanatorium work.

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## INFRA-RED PLATES IN NEUROHISTOLOGICAL ILLUSTRATION

BY D. M. BLAIR, M.B. GLASG.

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READER OF ANATOMY IN THE UNIVERSITY

(*From the Hambleden Department of Anatomy, King's College, London*)

(WITH ILLUSTRATIONS ON PLATE)

IN THE LANCET of May 27th, 1933, we described the use of infra-red photographic plates in a special study of certain types of nerve-cells. Since then we have explored the usefulness of these plates in another direction likely to be of more general interest to neurohistologists. The commonly used silver methods for demonstrating nerve-fibres produce a black coloration of the axis-cylinder processes of the nerves against a background of connective, muscular, or other tissue stained in varying shades of yellow or brown. The nuclei of the tissue cells vary in prominence of stain according to the method or modification employed. Often, especially in studying intracellular nerve-endings, it is useful to have the nuclei clearly indicated, but their dark-brown impregnation may obscure the appearance of the nerve-fibres. Photographic illustration of such preparations is specially difficult owing to the low actinic value of the yellow-brown background; even with panchromatic plates and appropriate colour filters it is not possible to produce a picture equal in clarity to that seen with the eye through the microscope. Probably this is one reason why convincing microphotographs of nerve preparations are seldom seen.

As we had found, in the special study of nerve-cells referred to, that the infra-red plates are sensitive to light waves below the visual spectrum which penetrated material stained dark brown, while the representation of structures stained black was unaffected, we tried the effect of photographing silver preparations of nerve-fibres with these plates. The accompanying illustrations show the value of this method in producing a clear picture hitherto unobtainable. The first picture (Fig. I. on Plate) shows the best result got on a panchromatic plate after trial of several colour filters, a result which failed to do justice to the original preparation, a section of a small branch of a coronary artery in the heart with the nerve-fibres supplying the muscle cells of the tunica media clearly stained. The second picture (Fig. II. on Plate) is of the same preparation on an Ilford infra-red plate; the nerve-fibres stand out clearly against a greatly subdued background; the terminal loop of an intracellular nerve-ending close to the left hand pole of a small pale nucleus is clearly seen in the upper part of the vessel wall; the cell nuclei still show sufficiently well for orientation purposes.

Infra-red photography thus provides a new instrument of great usefulness in producing clear and accurate illustrations of neurohistological material.

## DISLOCATION OF THE SEMILUNAR BONE

BY J. K. MONRO, M.B. CAMB., F.R.C.S. ENG., M.R.C.P. LOND.

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(WITH ILLUSTRATIONS ON PLATE)

DISLOCATION of the semilunar bone is an uncommon accident. During the past two years I have seen 5 cases, as compared with 25 cases of fracture of the carpal scaphoid. Often a fracture is produced by the same accident: thus in 4 of the 5 cases there were a fractured olecranon, a fractured lower end of the radius, and a fractured carpal scaphoid in two cases, in one of which there was also a fracture of a lumbar vertebra.

A window-cleaner, aged 17, on Sept. 6th, 1932, was riding a bicycle and carrying a ladder on his shoulder. The ladder caught against a lamp-post and he fell off, putting out his right hand to save himself. There was pain and swelling of the wrist, and he was treated for a sprain on a Carr's splint.

I first saw him at Poplar Hospital on Sept. 17th, when there was considerable diffuse swelling of the wrist, front and back, especially where the two transverse creases normally lie, these being obliterated. The whole swollen region was tender and he would allow almost no wrist movement. There was anæsthesia of the index-finger and of the dorsum of the terminal segment of the middle finger. The thumb could not be abducted nor opponated. A radiogram showed a complete anterior dislocation of the semilunar bone (Fig. I. on Plate).

As the dislocation was of 11 days' standing, no great hopes were entertained of the success of manipulation. This was, however, tried unsuccessfully, after which fixed traction was applied. A banjo splint was fixed to the wrist and forearm by plaster-of-Paris, and traction applied by needles through the terminal segments (pad, bone, and nail) of index, middle, and ring fingers.

The metal sides of the splint prevented a satisfactory lateral radiogram of the wrist-joint, but stereoscopic views showed clearly that the bone was still displaced forwards. The wires were tightened from time to time to maintain traction. At the end of 20 days radiograms showed an obvious increase in the joint space of wrist and carpus, but the dislocation persisting.

On Oct. 3rd a window was cut over the front of the carpus, and under nitrous oxide anæsthesia direct pressure was exerted on the region of the semilunar. There being already complete physiological division of the median at the wrist, I decided to take the chance of further damage to it. Another stereoscopic radiogram showed the dislocation still unreduced. It also showed that the semilunar was not at the centre of the window as had been

intended, but further proximally. The surface marking of the semilunar is the mid-point of the wrist between the two transverse creases—i.e., rather more proximal than one might expect.

On Oct. 7th the plaster was removed and, under nitrous oxide anæsthesia again, pressure was exerted with a knuckle over the semilunar, its exact situation as shown by the radiogram relative to the window having previously been marked on the skin. The wrist was flexed and extended while this pressure was maintained and traction exerted by an assistant on the fingers by the needles. A radiogram now showed the dislocation reduced—31 days after the accident (Fig. II.).

The anæsthesia of the index and paralysis of the thumb recovered about eight weeks later. On examination five months after the accident his condition was as follows. He is fit for his work. Function of the right wrist is perfect; he says that wrist is fully as good as the other. Making a fist is not perfect owing to slightly defective power of flexing the terminal interphalangeal joints of the three fingers that were transfixed. Therefore his grip is not quite perfect, but is improving. Movements of all muscles and sensation are normal. The holes in the nails of the three transfixed fingers have just reached the tips of the nails. In the pads of each of those fingers can be felt a small bump at the site of the transfixion. There is a well-marked ridge of nail dystrophy across all five nails of the right hand, while those of the left are normal.

The radiogram (Fig. I. B) shows that the semilunar is truly dislocated forward, its proximal articular surface being scarcely in contact with the lower articular surface of the radius, while the os magnum remains in its normal position. In the other four cases—e.g., Fig. III. B—the os magnum has gone backwards (in two accompanied by the outer or radial half of the scaphoid), while the semilunar is still in contact with the radius although tilted forwards.

Median paralysis occurred in three cases. In my patient recovery was complete eight weeks after reduction. Another patient recovered motor function in three months, but a year after the accident still has slight numbness of the tips of the thumb and index. The third has similar disability after 18 months, but in him the dislocation remains unreduced and he refused operation. He had no motor loss. My patient was seen late and manipulation was unsuccessful. I had not at that time read Watson Jones's article [1] on the subject, and the manipulation was not quite according to the technique he there describes. However, even in his hands, manipulation alone was never successful when the dislocation was of more than one week's duration. It was not easy to tell clinically in this case whether reduction had taken place, although it may be so in recent cases. Conwell says [2]: "When the wrist would remain in right-angle flexion without force and did not have a tendency to rise up, the semilunar was always reduced." When attempts at reduction are unsuccessful Watson Jones makes a 3-in. dorsal incision, releases the head of the os magnum from behind the posterior lip of the semilunar by dissection, and then reduces the dislocation by manipulation. The present case shows that the head of the os magnum can be released by fixed traction as well as by open operation, and suggests that it is worth while trying this before resorting to the posterior incision.

Böhler's methods [3] are as follows. If manipulation fails he drives a pin through the bases of metacarpals 2, 3, 4, and 5, and a pin through the olecranon. He applies screw traction between these and then manipulates the wrist. When he is satisfied that reduction has taken place, he applies a plaster with the wrist straight or in slight dorsiflexion, and leaves this on for three weeks. Older dislocations he reduces by pushing the semilunar back with an elevator through a 4-in. anterior incision, and he has had successes up to eight weeks after the accident.

There can be no doubt that reduction with a minimum of trauma is the best treatment for this dislocation, although excision through the anterior incision is easy, has been the usual treatment in the past, and may be needed in late cases. Similarly excision of part of an ununited fractured scaphoid instead of procuring [4] bony union is a second-best treatment.

As dislocation of the semilunar is produced by forced dorsiflexion, it seems reasonable to fix the wrist in palmar flexion after reduction. The shape of the articulating surfaces of semilunar and os magnum, however, makes redislocation unlikely, and fixation in flexion certainly has disadvantages. Böhler has a picture [5] of a wrist fixed in flexion, and under it the legend: "Every individual who is over 40 years old and is forced to carry this splint more than a week will surely become a cripple." One of the cases I have mentioned above was, after reduction, put in plaster in full flexion for 19 days, and now lacks 40 degrees of dorsiflexion—i.e., can dorsiflex only about 5 degrees beyond the straight position. This window-cleaner's wrist was merely bandaged to a Carr's splint for five days, during which finger movements were encouraged, and then the splint was discarded and active wrist movements started. In one of the cases in which fracture of the scaphoid had to be treated in addition to the dislocation of the semilunar-os magnum joint (Fig. III.), the wrist was manipulated and immediately fixed in plaster in full dorsiflexion. Redislocation did not occur and a satisfactory result followed (Fig. IV.). The man whose dislocation remains unreduced, having refused operation, has a very useful hand, but his grip is slightly weak and he lacks 30 degrees of flexion and 10 degrees of extension.

My thanks are due to Mr. Russell Howard for permission to publish this case, to Mr. Robert Milne for suggestions, and to Dr. M. H. Jupe for the radiograms.

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## A NEW TECHNIQUE IN GASTRO-JEJUNOSTOMY

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ALTHOUGH gastro-jejunostomy has now been in common use as a surgical procedure for more than a quarter of a century, it cannot even yet be claimed that its late results are always perfect; some are quite the reverse.

The late failures may be divided roughly into two classes: firstly, those in which the operation has been injudiciously done in unsuitable cases; and secondly, those in which the short circuit is mechanically unsound.

I am not concerned in this article with the first class, except to say in passing that the operation should never be performed unless a definite pathological lesion can be demonstrated in the theatre. It requires a certain amount of moral courage to

shut the abdomen when no ulcer can be found, because to do so is an admission that one's efforts to arrive at a correct diagnosis have proved inadequate. On the other hand, to do a haphazard gastro-jejunostomy and trust to luck (as I have occasionally seen done) is a surgical crime. Unfortunately, however, cases are still met with in which, even when a demonstrable lesion has been found, the condition is not alleviated by gastro-jejunostomy, or is alleviated for a time and then recurs. Gradual increase in our knowledge and experience and greater care in the selection and in the after-treatment of cases will probably reduce the number of such failures in the future.

But what I am concerned with here is the mechanically unsound anastomosis. It is largely due, I think, to the way in which the operation of posterior gastro-jejunostomy is commonly done.

After the portion of jejunum selected for the anastomosis has been decided on and clamped, the transverse mesocolon is held up and an opening is made in it, through which a portion of the posterior wall of the stomach is delivered. It is rarely, if ever, feasible to bring down more than a comparatively small portion of the stomach wall in this way, so that it is impossible to know exactly the relation of the blood-vessels in the portion so delivered to the subsequent anastomosis or to know the angle of the incision in the stomach wall, i.e., whether it is in the long axis of the organ, or whether it is oblique in one direction or another. These difficulties are correspondingly increased if the patient is fat or if the ulcer has caused, as it often does, adhesions in the lesser sac of peritoneum. In the latter case it may be necessary to exert undue traction to get down any portion of the stomach at all and this may cause splanchnic shock and a stormy convalescence.

Some years ago it occurred to me that an easier access to the posterior wall of the stomach would be provided by exposing it through an incision in the great omentum, and I evolved the following technique which has given me great satisfaction.

The abdomen is opened by a high right paramedian incision and a routine examination is made. As soon as I have decided that the case demands a gastro-jejunostomy I first remove the appendix as a routine measure.

I then make an incision in the gastro-colic omentum parallel with the greater curvature (Fig. 1). The omentum is here very thin and the incision is bloodless. I need hardly explain that this incision gives free access to the lesser sac, and through it the *whole* of the posterior wall of the stomach can be thoroughly examined. The site best suited for the anastomosis—i.e., the most mobile area and the one furthest from the blood-vessels—is selected and clamped.

The transverse colon is then held up by my assistant and a second opening made into the lesser sac through the transverse mesocolon (Fig. 2). With both sides of this structure exposed it is easy to select a relatively bloodless area.

A coil from the upper part of the jejunum is drawn up through the opening in the transverse mesocolon, and the most proximal part that can be apposed to the stomach without strain or tension is selected and clamped (Fig. 3).

The transverse colon is returned to the abdominal cavity and the anastomosis is made in the usual way, except that it is done in the lesser sac. Finally, the edges of the opening in the transverse mesocolon are fixed to the jejunum by a few interrupted sutures and the opening in the gastro-colic omentum is sewn up.

I have found this method to have many advantages over the orthodox one. The access to the lesser sac enables the whole of the posterior wall of the stomach to be examined so that the selection of an area, mechanically sound and free from the larger blood-vessels, can be made at leisure. All traction on the stomach is avoided, since the mobile organ (the jejunum) is brought up to the comparatively immobile organ (the stomach) instead of vice versa. This is a most important point. The absence of pulling diminishes shock and, if the patient is fat or the stomach is adherent or retracted, it renders comparatively easy an operation which might otherwise be extremely difficult. During the actual performance of the anastomosis the transverse colon is returned to the abdominal cavity and so is not liable to get chilled (as it is in the orthodox operation even if it is covered with a warm towel) and this also diminishes the shock. Since I have adopted this method I have had better results from the operation, both immediate and late.

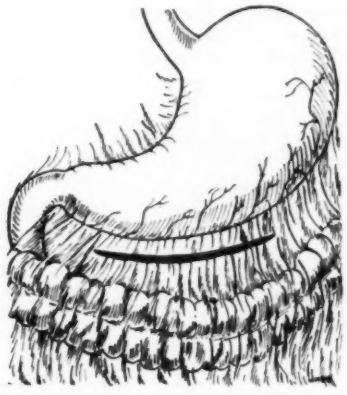

FIG. 1.—Showing incision in the gastro-colic omentum.

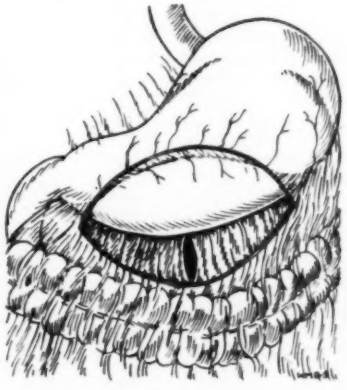

FIG. 2.—Showing the second incision into the lesser sac through the transverse meso-colon.

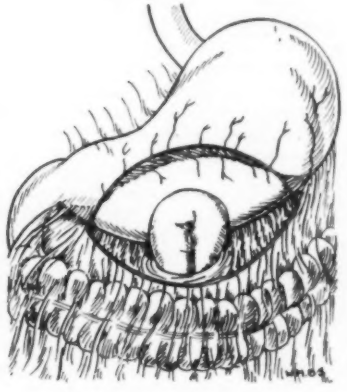

FIG. 3.—The jejunum has been drawn through the transverse meso-colon. The anastomosis is about to be made *above* the transverse colon.

DARLINGTON CONTRIBUTORY SCHEME.—The Darlington Memorial Hospital, which serves a population of nearly 150,000, is about to establish a contributory scheme. It is hoped to obtain a membership sufficiently large to provide an income of between £10,000 and £15,000 a year. Payments will range from 1*d.* to 3*d.* per week, the highest figure being that for husband and wife and their children under 16, whose family income does not exceed £312 a year.

# BACTERÆMIA IN LOBAR PNEUMONIA

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In the course of an investigation on lobar pneumonia [1] conducted in Knightswood Hospital over the period March, 1932, to May, 1933, special attention was paid to bacteræmia. An attempt was made to take daily blood cultures from each case during the course of the disease. In the method employed 7 c.cm. of blood was withdrawn from one of the veins of the arm, and of this amount 5 c.cm. was placed in a flask containing 75 c.cm. of Hartley's broth and incubated overnight, while the remaining 2 c.cm. was plated with 15 c.cm. of melted agar in order to determine the number of colonies present. By means of an all-glass syringe fitted with an iridio-platinum needle, together with ethyl chloride as a local anæsthetic, repeated cultures could be taken with minimal discomfort to the patient.

One hundred and twenty cases were examined, mild and abortive infections being excluded. The plate method for estimating the number of colonies was employed on 84 occasions. Table I. sets forth the percentages of positive results in the series under consideration.

Table I.—*Results of Blood Cultures in 120 Cases of Lobar Pneumonia*

| Type of pneumococcus. | Cases cultured. | Cases positive. | Percentages. |
|---|---|---|---|
| I. .. | 38 | 18 | 47·4 |
| II. .. | 51 | 28 | 55·0 |
| III. .. | 9 | 4 | 44·4 |
| IV. .. | 22 | 4 | 18·2 |
| Total .. | 120 | 54 | 45·0 |

The percentage of positive results for the whole series is 45, and the percentages for Types I., II., and III. are approximately equal. The relationship of bacteræmia to death-rate is expressed in Table II.

Table II.—*Relationship of Bacteræmia to Death-rate*

| Type of pneumo-coccus. | Cases studied. | | Cases showing positive blood cultures. | | Cases showing negative blood cultures. | |
|---|---|---|---|---|---|---|
| | Cases. | Deaths and per cent. | Cases. | Deaths and per cent. | Cases. | Deaths and per cent. |
| I. | 38 | 8 (21) | 18 | 8 (44·4) | 20 | 0 |
| II. | 51 | 19 (37·2) | 28 | 17 (60·7) | 23 | 2 (8·7) |
| III. | 9 | 4 (44·4) | 4 | 4 (100·0) | 5 | 0 |
| IV. | 22 | 1 (4·5) | 4 | 1 (25·0) | 18 | 0 |
| Total .. | 120 | 32 (26·7) | 54 | 30 (55·5) | 66 | 2 (3·0) |

The data presented demonstrate the great difference in mortality between cases with positive cultures and those in which no bacteræmia occurred. In the one series the death-rate is 55·5 per cent., as against 3 per cent. in the other.

Table III. gives the results of colony counts in 11 cases of Type I. pneumonia in which organisms were recovered from the blood. Of seven fatal cases four were due to septicæmia, and two deaths occurred in spite of the fact that an invasion of the blood stream to the extent of 82 and 75 colonies respectively per 2 c.cm. of blood had been overcome. The remaining death was that of a frail and elderly patient aged 63, illustrating how an old person with poor resistance may succumb to a low-grade infection.

Table III.—*Degree of Bacteræmia in 11 Cases of Type I. Pneumonia*

| Age in years. | Day of illness. | | | | | | | | | Result. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | |
| 32 | − | − | − | + | − | − | − | + | − | Well. |
| 33 | .. | .. | .. | .. | .. | + | 4 | − | − | ,, |
| 32 | .. | .. | .. | .. | 30 | − | − | − | − | ,, |
| 17 | .. | .. | .. | − | − | 10 | − | − | − | ,, |
| 34 | .. | 10 | 82 | 2 | − | − | − | .. | − | Died 25th day. |
| 30 | .. | .. | 75 | 5 | − | − | .. | .. | .. | ,, 6th ,, |
| 18 | − | 12 | 2 | 4 | 5 | 6 | 16 | 106 | 784 | ,, 11th ,, |
| 38 | .. | .. | .. | − | 15 | 100 | 11 | 50 | 642 | ,, 12th ,, |
| 22 | .. | .. | .. | .. | 70 | 500 | .. | .. | .. | ,, 8th ,, |
| 41 | .. | .. | .. | .. | .. | 30 | 242 | .. | 3000 | ,, 9th ,, |
| 63 | .. | .. | .. | .. | − | − | − | + | − | ,, 13th ,, |

In the above table and Tables IV. and V. the figures indicate the number of colonies in 2 c.cm. of blood; +, organisms recovered from 5 c.cm. but not from 2 c.cm. of blood; and −, no organisms in 5 c.cm. of blood.

The degree of bacteræmia in 19 cases of Type II. pneumonia is shown in Table IV. In this series there were 11 deaths, and of these eight were due to septicæmia and one to the effects of bacteræmia.

Table IV.—*Degree of Bacteræmia in 19 Cases of Type II. Pneumonia*

| Age in years. | Day of illness. | | | | | | | | | Result. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | |
| 29 | .. | .. | .. | + | − | − | .. | .. | .. | Well. |
| 28 | .. | .. | .. | .. | + | − | − | .. | .. | ,, |
| 38 | .. | .. | .. | .. | .. | .. | + | + | + | ,, |
| 34 | .. | .. | .. | .. | 1 | 4 | 4 | − | − | ,, |
| 37 | .. | .. | .. | .. | .. | .. | .. | 15 | − | ,, |
| 28 | + | − | 1 | 18 | + | − | − | .. | .. | ,, |
| 31 | − | − | − | 8 | 10 | 1 | + | − | .. | ,, |
| 21 | .. | 80 | 2 | 2 | 1 | − | − | .. | .. | ,, |
| 24 | .. | − | − | − | 1 | 500 | .. | .. | .. | Died 8th day. |
| 37 | .. | − | − | − | 30 | 5000 | .. | .. | .. | ,, 7th ,, |
| 29 | .. | − | 32 | 340 | 3000 | .. | .. | .. | .. | ,, 6th ,, |
| 54 | .. | .. | .. | .. | + | 24 | 2000 | .. | .. | ,, 8th ,, |
| 45 | .. | .. | .. | .. | .. | 40 | 90 | 5000 | .. | ,, 8th ,, |
| 55 | .. | .. | .. | .. | 600 | .. | .. | .. | .. | ,, 7th ,, |
| 42 | .. | .. | .. | .. | .. | 400 | .. | .. | .. | ,, 8th ,, |
| 22 | .. | .. | .. | .. | .. | .. | 1 | 2 | 3000 | ,, 9th ,, |
| 28 | .. | .. | .. | .. | + | 30 | 115 | + | + | ,, 10th ,, |
| 20 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | ,, 8th ,, |
| 21 | .. | .. | .. | 45 | .. | .. | .. | .. | .. | ,, 4th ,, |

Two occurred in young adults who showed marked delirium and toxæmia during the acute phase of the illness, and from whom, eight hours before death, 2 and 45 colonies respectively were recovered from

Table V.—*Degree of Bacteræmia in Two Cases of Group IV. and Three Cases of Type III. Pneumonia*

| Type. | Age in years. | Day of illness. | | | | | | Result. |
|---|---|---|---|---|---|---|---|---|
| | | 2nd | 3rd | 4th | 5th | 6th | 7th | |
| G. IV. | 34 | .. | + | 1 | + | − | .. | Well. |
| G. IV. | 35 | 2 | − | − | − | + | − | ,, |
| T. III. | 62 | − | − | − | − | − | + | Died 8th day. |
| T. III. | 52 | .. | .. | − | 2000 | .. | .. | ,, 6th ,, |
| T. III. | 73 | .. | .. | − | − | 224 | 3000 | ,, 7th ,, |

On the 1st, 8th, and 9th days there were no counts.
G. = group; T. = type.

2 c.cm. of blood. The table also records a noteworthy case of recovery after a bacteræmia of 80 colonies per 2 c.cm. on the second day of illness.

Data dealing with the presence of bacteræmia in three cases of Type III. and two cases of Group IV.

pneumonia are presented in Table V. There is a slight degree of bacteræmia in the Group IV. cases, a result in keeping with the mild nature of the Group IV. infections admitted to Knightswood Hospital during the past year. As regards the Type III. pneumonias, the table brings out two points, namely, that the infections occurred in elderly persons and that the bacteræmia developed as a terminal symptom.

There is evidence to the effect that the development of complications is related to the presence of bacteræmia. This is illustrated in Table VI. In those cases in which both bacteræmia and leucocytosis were studied, the onset of complications was preceded not only by a positive blood culture but also by a high leucocytosis. Colony counts were made in two instances. In the Type II. pneumonia which was followed by a pneumococcal abscess of the neck, there was a low degree of bacteræmia, the organisms being recovered on the seventh, eighth, ninth, and tenth days from 5 c.cm., but not from 2 c.cm. of blood. On the other occasion the development of a pulmonary abscess was preceded by the presence of 80 colonies in 2 c.cm. of blood on the second day of illness and, as indicated above, the patient made a good recovery.

TABLE VI.—*Relationship of Complications to Bacteræmia*

| Type of pm. | Complication. | Day of illness on which bacteræmia occurred. | White cell count. |
|---|---|---|---|
| I. | Empyema. | 6th. | 36,600 |
| I. | ,, | 6th. | 31,900 |
| I. | ,, | 4th. | 24,700 |
| II. | Pneumococcal abscess of neck. | 7th, 8th, 9th, 10th. | 60,000 |
| II. | Pulmonary abscess. | 2nd, 3rd, 4th, 5th. | — |
| II. | Pericarditis. | 4th and 5th. | 44,500 |
| II. | ,, | 5th, 6th, 7th, 8th. | — |

White cell count = count corresponding to the last positive blood culture. pm. = pneumococcus.

LEUCOCYTOSIS

The importance of leucocytosis in lobar pneumonia has been emphasised recently by Cruickshank,[2] who does not consider that blood culture should take precedence over the leucocyte count as a factor in prognosis. In the series under review a low leucocyte count was found in association with fatal septicæmias.

For example, a male adult of 29 years, suffering from a Type II. pneumonia, had colony counts of 32,340 and 3000 per 2 c.cm. of blood on the third, fourth, and fifth days of illness respectively, with corresponding white cell counts of 11,000, 6600, and 3200. On the other hand, a male adult of 30 years with a Type I. pneumonia, in which an invasion of the blood stream by pneumococci to the extent of 75 colonies on the third day of illness was successfully overcome, died on the sixth day with a negative culture and a leucocyte count of 42,000.

Further, it will be observed from Table VI. that counts of 40,000 to 60,000 may be obtained towards the end of Type II. illnesses. In this connexion it is of interest to note that Blake and Cecil,[3] in their studies on experimental pneumonia in monkeys, found that a persistent septicæmia with a rising leucocytosis during the latter part of the disease has nearly always been associated with the development of a complication such as empyema or pericarditis.

From the foregoing it is evident that the development of complications is associated with the presence of bacteræmia and high leucocytosis, and that a high white cell count in any individual case indicates resistance to infection, but does not necessarily mean recovery. Bacteræmia is a common feature of lobar pneumonia and, despite the high mortality figures presented in Table II., recovery of pneumococci from 5 c.cm. of blood may be of little importance in prognosis. The development of over 20 colonies from 2 c.cm. of blood in a healthy adult, however, represents a high degree of invasion, and guidance as to the outcome of the illness can best be obtained by further investigation. Increasing colony and leucocyte counts indicate severe invasion but good resistance, while increasing colony and falling white cell counts are of grave import and signify lack of resistance to a virulent infection.

The effects of bacteræmia, when correlated with the clinical findings, may be summarised :—

(*a*) When there is an overwhelming septicæmia and a low white cell count, there is rapid exhaustion of bone-marrow cells with complete lack of resistance on the part of the patient and the issue is invariably fatal. In the series under review, septicæmia was most frequently found in Type II. infections.

(*b*) When a high degree of bacteræmia is successfully overcome, but the local lesion remains active, the patient may die, either in a short space of time or weeks later.

(*c*) When bacteræmia of varying degree is accompanied by a high leucocytosis the illness may be followed by the development of complications, and the prognosis depends on the nature of the complication. It is possible that in Type II. infections complications occur when a persistent bacteræmia is accompanied by a high leucocytosis during the latter part of the disease.

(*d*) When there is a transient bacteræmia during the acute phase of the illness, patients who have sufficient reserve and ability to resist the degree of invasion recover without ill-effects.

CONCLUSIONS

(1) Pneumococcal septicæmia is a frequent cause of death in lobar pneumonia. (2) Bacteræmia is a common feature of lobar pneumonia. (3) This bacteræmia may be present at the onset of the illness, to disappear or become diminished in severity on the third to fifth day, and may appear to a slight extent on the fifth to ninth day without serious prognostic significance. (4) The persistence of a bacteræmia throughout the course of the illness, or a rising bacteræmia after the fourth day of illness, as estimated by colony enumeration in 1 or 2 c.cm. of blood, is of grave prognostic significance, indicating the development of a local complication or a fatal septicæmia. (5) Leucocytosis is also a valuable aid in prognosis when taken in conjunction with the degree or absence of bacteræmia. (6) There appears to be no essential difference in the development of bacteræmia in Type I. or Type II. infections, apart from the fact that the secondary septicæmia after the fourth day of illness occurs more commonly in Type II. pneumonias and plays an important part in accounting for the high death-rate in these illnesses.

I desire gratefully to acknowledge the encouragement received from Dr. William Dow, medical superintendent of Knightswood Fever Hospital.

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FOREIGN MEAT IN HOSPITALS.—The Manchester public health committee has refused to order that "English meat only" should be served in the city hospitals on three days of the week, on the grounds that the cost of the change would be "at the rate of £11,700 a year," and that the medical officer was not satisfied that any advantage in nutriment at all commensurate with the cost would be obtained by substituting English for imported meat.

# MULTIPLE MALIGNANT NEW GROWTHS
## ASSOCIATED WITH CARCINOMA OF THE ŒSOPHAGUS

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IN a small series of 40 cases of œsophageal cancer I have encountered 4 in which the patient proved to have more than one growth.

CASE 1.—A male, aged 67, came to the Royal Southern Hospital in September, 1931. He complained of difficulty in swallowing of seven months' duration. During the previous five months there had been occasional difficulty when swallowing fluids, and on the above date he was able to take fluids only. Radiological examination showed a complete hold-up of the barium paste at the level of the third dorsal vertebræ. By œsophagoscopy in October a typical proliferative malignant stricture was found 9½ in. from the incisor teeth. This was dilated, and a Souttar's tube inserted. A week later the tube was removed, and a smaller-sized tube with ten 1·0 mg. radium needles distributed on its external surface was inserted into the stricture. This tube was removed in seven days' time; three weeks later the patient was swallowing ordinary food, and radioscopy showed "no delay and no irregularity of filling" of the œsophagus with barium paste.

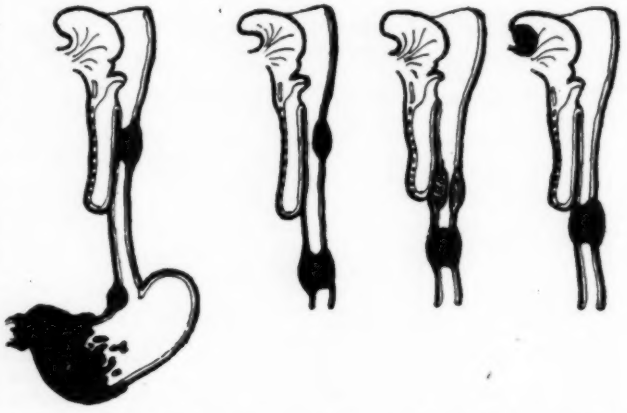
In February, 1932, the radiological report was: "Slight constriction and irregularity of œsophagus at level of third and fourth dorsal vertebræ—pointing to a lesion in this region; ? malignant. No delay above lesion." In May, 1932, the patient was again experiencing difficulty in swallowing, and œsophagoscopy showed a very firm hard stricture at the level of the previous lesion; there was no obvious ulceration however. The stricture was dilated with some difficulty and a Souttar's tube again inserted. In July the tube was removed, as it had become blocked with sago pudding. The patient now began to go downhill, although previously he had been slowly gaining weight. He died in October, 1932, and he was able to swallow up till the time of death. At no time during his illness had he complained of abdominal symptoms.

Dr. R. H. Mole, pathologist to the hospital, performed an autopsy and reported as follows: "Opposite the upper end of the trachea the œsophagus is very constricted by a nodular growth. The surface of the growth is smooth and no apparent ulceration is present. The trachea shows no lesion. No enlarged glands. The pyloric end of the stomach shows what is apparently scirrhous carcinoma, extending for several inches from the pylorus and encircling it. At the proximal margin are several apparently discrete small growths. On the lesser curvature near the œsophageal opening is a nodule of growth 0·5 in. in diameter. The cardiac end is dilated (Fig. 1). Mesenteric glands show numerous metastases. The œsophageal growth is different from the stomach growths; all are carcinomatous, but implantation of the œsophageal growth on the gastric mucous membrane, in view of the difference in character of the growths, is unlikely."

CASE 2.—A male, aged 65, came to St. Helens Hospital in June, 1930. He stated that he had experienced difficulty in swallowing for nine months, and at that date he could take only soft solids and fluids. Radioscopy showed a partial hold-up of the barium paste in the middle third of the œsophagus. He was admitted the following week, and two ulcers were found by œsophagoscopy. The proximal and smaller ulcer was situated 7½ in. from the incisor teeth on the left posterolateral wall, and the œsophagoscope passed this easily without inflicting any obvious injury. The distal ulcer, which was 11½ in. from the teeth, had the appearance of a typical malignant stricture, and no attempt was made to pass the œsophagoscope beyond the neoplasm. The intervening mucous membrane between the two growths appeared normal through the œsophagoscope (Fig. 2). Small pieces were removed from both ulcers, and Prof. J. M. Beattie reported that "sections show marked invasion of the muscular wall with epithelial cells. The condition is definitely malignant." In view of the double lesion intra-œsophageal treatment was considered to be unsuitable. In September, 1930, the patient submitted to gastrostomy, and he died two months later in November, 1930. No autopsy was performed.

CASE 3.—A female, aged 46, came to the Royal Southern Hospital in April, 1932, complaining of difficulty in swallowing which had been present for the "past few months." At that date she was able to take soft foods only. She stated that she had suffered from "stomach trouble" for two years previously. Radioscopy showed "marked irregularity of the middle third of the œsophagus pointing to malignant disease." A few days after admission œsophagoscopy was performed, and a hard ulcerated stricture was found 10 in. from the incisor teeth. This stricture was dilated and a Souttar's tube inserted. A snipping was removed from the growth, and Dr. Mole reported "epithelioma." Sixteen days later the Souttar's tube was removed, and a tube with nine 1·0 mg. radium needles was inserted. This was removed in eight days' time, and the patient was discharged a week later able to swallow comfortably.

FIGS. 1 2 3 4



She went away to Scotland for a holiday and could swallow ordinary food until July, 1932. In that month she was readmitted to hospital owing to sudden difficulty in swallowing. Œsophagoscopy was carried out immediately, and a hard scarred stricture with no evidence of ulceration was found at the site of the previous lesion. It was impossible to pass the œsophagoscope through this stricture, but a small bougie went through the aperture with ease for about 2 in. At that penetration the passage of the bougie was arrested, and with some difficulty an aperture was located and the instrument passed onwards towards the stomach (Fig. 3). Both strictures were then dilated, but owing to the excessive amount of bleeding it was impossible to examine the distal stricture very thoroughly. Seventeen hours later the patient suddenly collapsed when using the bed-pan, and she died within a few minutes. Hæmorrhage or perforation of the gullet appeared to be the immediate cause of death. Permission for autopsy was refused.

CASE 4.—A male, aged 62, came to the Royal Southern Hospital in May, 1932. He stated that since eating some "salt fish" four days previously he had been unable to swallow either solids or fluids, and that he had experienced no difficulty before this. Radioscopy showed a complete hold-up of barium paste in the lower third of the œsophagus. He was admitted the same

day and examined with the œsophagoscope. At 13 in. from the incisor teeth a large mass of barium and dry flakes of fish were found. This was removed with difficulty owing to its friable nature and considerable quantity. It was suspected at the time that there was an early submucous neoplasm of the posterior œsophageal wall at the site of impaction. On the following day the patient appeared to be swallowing normally, and the radiological report was as follows: "The outline of the œsophagus is *slightly* ragged at the site where the foreign body was impacted."

The patient was discharged three days later, and was instructed to report in four weeks' time. He failed to return to hospital until November, 1932, when he came up looking very ill and complaining that he could swallow fluids only and with difficulty. Radiological examination showed "irregularity of œsophagus at level of eighth and ninth dorsal vertebræ, with dilatation of œsophagus above. The X ray appearances point to malignant disease rather than adhesions or spasm." He was admitted in the following week, and on œsophagoscopy was found to have an ulcerating malignant stricture of the œsophagus 13½ in. from the incisor teeth. This was dilated and a Souttar's tube was inserted. A week later the Souttar's tube was removed and a special rubber radium-carrying tube with 12 1·0 mg. radium needles was inserted into the stricture. The radium was removed in seven days' time. The radiological report on Dec. 23rd was: "There is now no appreciable 'hold-up' in the œsophagus." On Dec. 31st the patient was discharged, having gained 5½ lb. in weight and having been able to eat the usual dinner of turkey and plum pudding on Christmas Day.

He failed to report again until Feb. 28th, 1933. He then stated that after his discharge from hospital he had felt a soreness under the left side of his tongue. He thought that this must be due to a tooth, so he went to the Dental Hospital. He was referred from there to the Royal Infirmary, where he was found to be suffering from an epithelioma of the tongue (Fig. 4). Mr. R. Kennon has kindly allowed me to use the following particulars, which were supplied by Mr. R. Silverstone: "This patient was admitted on Feb. 17th under Mr. Kennon. He had an epithelioma on the left lateral side of the tongue extending from the sulcus terminalis forwards for about an inch. The mucosa over the dorsum of the swelling was normal, but it was ulcerated on the under surface, where there was some attachment to the floor of the mouth. Three 2·0 mg. radium needles were inserted for seven days. He was discharged on Feb. 27th, 1933."

Case 1 may be regarded as one of primary double carcinoma, and the interest of this condition lies in its rarity. According to Siebke's [1] statistics primary double cancer occurs about once in every 1000 autopsies. Abel,[2] describing carcinoma of the œsophagus, states that "occasional cases are recorded in which a primary growth has arisen in the œsophagus and a second primary growth has made its appearance in some other organ of the body. This, however, does not occur as often as would be expected." Polson and McIntosh [3] published the post-mortem findings of a case of multiple squamous carcinomata of the œsophagus in which there were multiple primary adenocarcinomata of the sigmoid colon. In their case the disease of the bowel had remained undiagnosed during life, as did the gastric lesion of Case 1 described above. Until the receipt of the pathologist's report the possibility of implantation of growth on the gastric mucous membrane from the œsophageal neoplasm by physiological propulsion had been considered. Abel writes that "it is very doubtful if spread by physiological propulsion ever occurs in either the œsophagus or the pharynx"; although Hoche [4] has described a case in which an epithelioma arose on a gastric ulcer in a patient suffering from carcinoma of the œsophagus.

Cases 2 and 3 illustrate the spread of œsophageal carcinoma by lymphatic permeation. This method of spread is similar to that which occurs in other organs, via the submucous lymphatics; the secondary growths are upshoots to the surface, and the intervening mucous membrane appears normal. In Polson and McIntosh's case there were one primary growth and three secondary growths in the œsophagus. Although this mode of spread may not be very uncommon it is rarely seen during life. Chevalier Jackson [5] saw two cases only in which there were two separate lesions in a series of 671 cases of carcinoma of the œsophagus. He was undecided if these were cases of implantation or true multiple primary foci. Probably they were both examples of lymphatic permeation. He writes: "The same condition may have existed in other cases, but it is only rarely that a cancerous growth is seen early enough to pass beyond it for exploration of the subjacent œsophagus." Souttar [6] mentions that such multiple nodules are of importance as they may produce multiple strictures. This did occur in Case 3. The patient was treated with radium for a malignant stricture. Three months later, when this growth appeared by œsophagoscopy to be healed by scar tissue, a second more distal stricture developed and proved fatal.

Case 4 is an example of spread by implantation. It is probable that at the œsophagoscopy in May or in November the under surface of the tongue was injured and that carcinomatous cells were implanted either from the instruments or during post-anæsthetic vomiting. Spread of œsophageal carcinoma by implantation is considered by Abel to be very rare. J. B. Oldham,[7] however, in a brief review of multiple new growths of the buccal cavity, points out that "implantation carcinoma of the mucosa of the alimentary canal has occurred on many occasions, and traumatised tissues are especially fertile beds for this development."

There can be no doubt that it is unusual to see such a large proportion of multiple new growths in so small a series of cases (4 in 40), particularly in œsophageal carcinoma, which as a rule is rapidly fatal once obstructive symptoms arise. There are two aspects of carcinoma of the œsophagus regarding which opinions are divergent: that of the degree of its malignancy and that of its metastasising tendency. The four cases reported above appear to support the doctrine of the great virulence of such growths.

In addition to the acknowledgment made in the text, I am indebted to Dr. J. H. Mather, hon. radiologist to the Royal Southern Hospital, for repeated examinations and reports; and also to Mr. W. Sanderson, hon. laryngologist, for permission to treat Cases 1, 3, and 4.

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MILE END HOSPITAL.—The hospitals' committee of the London County Council reports that the out-patient department at this institution is inadequate, the various sections of which it is composed being scattered in parts of old buildings which are ill-adapted for the purpose. A new one-story building is therefore to be erected at a cost of £7821, including accommodation for massage and remedial exercises, eye, throat, and dental rooms, an antenatal section, and the necessary appurtenances.

# MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE

### SECTION OF ORTHOPÆDICS

AT a meeting of this section on Oct. 3rd Mr. ST. J. D. BUXTON delivered a presidential address on

**Injuries to Joints**

The problems of particular interest at the present time, he said, fell into three groups: (1) the prevention and cure of adhesions resulting from injury; (2) the effect of an injury on an epiphysis and on articular cartilage; (3) the mechanical and operative treatment of fractures into joints. The usual line of detachment of a typical "separated epiphysis" did not involve the epiphysis itself, and if the displaced portion were accurately replaced no pathological changes were seen in the epiphysis. Complete separation of the head of the radius and separation of the capitellar epiphysis were not uncommon injuries in children. If manipulation failed to realign the parts operation was indicated, preferably open replacement without internal fixation. If the parts would not remain in position they must be fixed by bone or nail; catgut seldom held the fragments in children. Removal of fragments was most undesirable on account of the resulting deformity as the limb grew. If the nail or peg was to be removed as soon as the union had occurred, it was advantageous to use a round nail with a large rounded head which could be left just outside the cartilaginous surface. If the foreign body was to be left permanently, an autogenous bone graft or beef bone peg was preferable. It should be driven well home with a mallet and punch. The joint should be disturbed as little as possible in children, and if synovial membrane had to be divided it should be carried out near the reflection from the edge of the bone and in one line.

The principles governing the treatment of fractures into joints in adults were somewhat different, because there were no epiphyses, comminuted fractures were more frequent, and free movement was more difficult to obtain. Although the deformity resulting from such operations as the removal of the head of the radius was more than compensated for by the increased movement obtained, nevertheless replacement of fractured intra-articular bone was desirable if a useful joint was to be regained. The capitellum could often be fixed by catgut in the young adult. Factors influencing the amount of movement obtained were: the fixation of bony fragments, the severity of the primary injury, delay in operation, technique in dealing with torn synovial membrane and capsule, and after-treatment. Removal of portions of the fractured bone was definitely advantageous in patients past middle life. After T- and Y-shaped fractures into the elbow, full movement was seldom obtained; for the best result the articular cartilage at the lower end of the humerus should be brought into as good alignment as possible, and this was most easily done by means of a transverse screw. Admittedly, movement was more limited after this fixation than after an extra-articular method. The range of movement was not increased by breaking down adhesions under anæsthesia; the best after-treatment consisted of active movements and exercises. Physical treatment was essential for all adult cases.

OSTEOCHONDRITIS AND BLOOD-SUPPLY

The recent work of Leriche and Policard explained the pathological changes in injured epiphyses. Briefly, their theory was that anæmia of bone led to sclerosis, while hyperæmia led to decalcification. The changes in epiphyses after operation for fracture had the radiological appearance of osteochondritis. In children the ossified nucleus of the replaced portion suffered anæmia and therefore sclerosed, later becoming revascularised and regaining its normal shape. Pseudocoxalgia and lesions of epiphyses of the limb bones which showed comparable radiological changes had been classified under the name of osteochondritis. The head of the femur might show the changes of osteochondritis after Lorenz reduction for congenital dislocation of the hip; trauma to bone or blood-vessels or both must be the ætiological factor. Unfortunately, erroneous observations on the blood-supply to joints had replaced the original descriptions of William Hunter, and only recently had correct knowledge been obtained. The blood-supply of the epiphysis and the diaphysis were distinct, and no vessels penetrated the growth cartilage. The vessels of the diaphysis were virtually end arteries, and the plate of cartilage between it and the epiphysis was avascular. Articular cartilage was normally avascular, but synovial fluid was probably of value to it. When the growth cartilage calcified and was replaced by bone, an anastomosis between the blood-vessels of the epiphysis and diaphysis occurred. Obviously, therefore, the end of the bone in the adult was more richly supplied with blood-vessels; it did not show fragmentation and sclerosis, but far more often a decalcification due to injury or hyperæmia. In osteochondritis dissecans, however, the detached fragments might show changes due to anæmia. The alteration in the child's epiphysis was probably due to a lesion of its blood-supply. A congenital theory seemed out of place when a lesion comparable to pseudocoxalgia might appear in such a large number of epiphyses. The tendency of osteochondritis to recover better in the elbow than in the hip was undoubtedly due to the absence of weight passing through the joint surfaces. A joint examined radiologically after the injection of uroselectan showed no more than a joint examined by X rays directly. That injury was the primary cause of osteochondritis, by cutting off the blood-supply, was a theory that had certainly not been proved, but the changes in the cartilage in children seemed to be those of anæmia.

The principles of treatment of fractures into joints in children might be summed up as: (1) Reposition of the fragments as accurately as possible by manipulation; if operation was necessary the removal of bone and cartilage should be avoided. (2) The joints should be disturbed as little as possible, and synovial membrane should be divided in one line near its reflection. (3) If an intra-articular peg was needed, it should be removed subsequently, or so placed that it was wholly outside the joint cavity. The principles governing the treatment of the joints in adults differed in that: (1) Broken-off fragments should be removed if their reposition narrowed the joint space. (2) Extra-articular fixation was preferable, provided that accurate alignment of articular cartilage could be obtained. (3) Physical treatment was essential whether the case had been treated surgically or not.

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PHYSIOLOGICAL SOCIETY.—The next meeting of this society will be held in the Sherrington school of physiology, St. Thomas's Hospital, on Saturday, Oct. 21st. A joint discussion with the food group will take place at the London School of Hygiene and Tropical Medicine on the previous day.

# REVIEWS AND NOTICES OF BOOKS

## The Thyroid Gland, its Chemistry and Physiology

By CHARLES ROBERT HARINGTON, M.A., Ph.D., F.R.S., Professor of Pathological Chemistry in the University of London. London: Humphrey Milford, Oxford University Press. 1933. Pp. 222. 15*s*.

THE complexity of the internal secretions is ever-increasing, as shown by the fact that it is now only possible to treat with one hormone in one particular volume. The amount of literature accumulating is particularly unwieldy on hormones such as those of the sex glands, but as has been pointed out in these columns this has been solved by the excellent work under the editorship of Prof. Allen, entitled "Sex and Internal Secretions."

Prof. Harington has rendered a valuable service in adding what might be termed a standard work to the library of the worker interested in hormones. The history of our knowledge of the internal secretion of the thyroid gland stretches back into the very distant past. Prof. Harington wastes no time in tracing the gradual evolution of present theories from their tentative beginnings, but plunges abruptly into an account of the general physiology of the thyroid gland as far as it is now worked out. The second chapter is concerned with the chemistry of the thyroid and the iodine compounds which it contains, with a full review of various preparations such as iodothyrin and thyroglobulin. It is debatable whether the amount of work which the compilation of this section must have entailed is really worth while, since the exact chemical nature of the compounds described is still uncertain. The third chapter deals with simple goitre and cretinism; Prof. Harington's outlook is fundamentally that of an organic chemist, and these clinical conditions seem to interest him less than those which touch his own work more closely. Possibly in a future edition he could here enlist the collaboration of an experienced clinician. It is from the fourth chapter onwards that he comes to problems which have long excited his interest and to the solution of which he has contributed much—the isolation of the iodine compounds of the thyroid gland, the general chemistry of thyroxine, its chemical constitution, and methods of assay. It is disappointing to find in his account of the inter-relationship between the thyroid and other endocrine organs no reference to the recent publications on the question of the thyrotropic hormone. In his final chapter on the biochemical aspects of Graves's disease too little space has been devoted to a discussion of the relative value of the views of Marine and Plummer. We hope Prof. Harington will deal with these interesting problems at greater length in his next edition. The value of the work as it stands lies in its sound analysis of the biochemical and purely chemical aspects of the thyroid gland, and it will form a monograph of permanent value.

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## Neurology : Psychiatry

Edited (1) by PETER BASSOE, (2) by FRANKLIN G. EBAUGH. Practical Medicine Series of Year Books. Series 1932. Chicago: Year Book Publishers. Pp. 488. $2.25.

THE nearest equivalents in English to the comprehensive abstracts of the current literature of special branches of medicine published in a German Zentralblatt or Bericht are the reviews and summaries in the special journals, and the Year Book Series to which this volume belongs. The series provides a fair guide to the chief lines of advance and interest during the period covered. Unfortunately it is not clear on what principles articles are selected for inclusion—whether intrinsic value, country and language of publication, or nature of subject are the deciding factors. In the neurological section of this volume the question is of less interest because the ground is covered methodically and with no particular bias in favour of American writers. It is an excellent collection, with the minimum of comment, of the more significant clinical and pathological papers that have appeared during 1932. The shorter psychiatric section, however, is more open to objection. The comments are not so much critical estimates as naïve or didactic expansions. Many important papers that appeared in foreign journals are omitted, but room is found for some articles in which nothing is said but platitudes, if the summary is to be trusted, and the fullest abstracts are of general papers bearing on administration, education, and sociology. Some of the summaries are unintelligible, e.g., that of Lingjaerde's article on schizophrenia (p. 423) or the report of the Bonn meeting (p. 353). The book will thus be really useful to neurologists and less so to psychiatrists.

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## Human Mentality

An Outline of General Psychiatry. By BROR GADELIUS. Copenhagen: Levin and Munksgaard. London: Humphrey Milford, Oxford University Press. 1933. Pp. 620. 30*s*.

THIS large and well-produced book by the professor of psychiatry at Stockholm is evidently the fruit of much reading and experience. Intended as a general guide to normal as well as to morbid psychological phenomena, it is indicative of the value of a mode of thought which constantly insists on the relation between mental disorder and healthy life. After an introduction dealing with the history of psychiatry and its working methods, the functional structure of mental life is examined in 13 chapters, making up half the book. In the next section the causation of mental disorders, especially the constitutional and hereditary factors, is expounded; the third section covers the principles of modern treatment and the forensic aspects of psychiatry. A lengthy chapter in this last section is devoted to a severely critical examination by Prof. Gadelius of the theory and practice of psycho-analysis. The book is learned and thoughtful and probably deals more fully and satisfactorily with its subject than any other work available in English. Its length is largely due to the discursive style which the author has deliberately chosen to avoid a dry, unattractive mode of exposition. Many psychiatrists who will find the book profitable to read would doubtless have preferred a more disciplined and succinct presentation, making greater demands on the reader's attention but less on his time. The findings of recent research in many countries have been taken into account by Dr. Gadelius in sufficient measure to ensure for his book a conservative modernity. A translation of the second part of the work, which has so far appeared only in Swedish, is to be looked for; it will deal with special psychiatry. The English of this volume is correct and readable.

## Rose and Carless' Surgery

Fourteenth edition. By CECIL P. G. WAKELEY, F.R.C.S., F.R.S. Edin., Surgeon, King's College Hospital, Belgrave Hospital for Children, and West End Hospital for Diseases of the Nervous System; and JOHN B. HUNTER, M.C., M.Ch., F.R.C.S., Surgeon, King's College Hospital, and to Royal Northern Hospital and Royal Chest Hospital. London: Baillière, Tindall and Cox. 1933. Pp. 1487. 30*s*.

WHEN a text-book has been an outstanding success with generations of students it requires a certain amount of courage to alter its character even in small degree. Rose and Carless at its birth was eagerly welcomed by the undergraduate, and in its maturity remained in almost undiminished favour. It has been steadily kept up to date in each of the subsequent 13 editions, but its general arrangement and make-up has been unchanged. With growth of knowledge and alteration of outlook this scheme could obviously not persist indefinitely if the book was to retain its popularity. The new editors, Mr. C. P. G. Wakeley and Mr. J. B. Hunter, have recognised this and laid their plans accordingly. They have revised where revision seemed necessary, and retained that which they deemed sound. The result is a new text-book of surgery of the best modern type. There has been considerable alteration, particularly in the chapter on thoracic surgery, and new work, such as that on the sympathetic system, has been incorporated. The old arrangement by which reproductions of radiographs were collected together at the end was never very satisfactory. They are now interpolated throughout the book; this has become possible because suitable paper has been selected for this purpose. A large number of new illustrations have been added, and many appear in colour. When, for the sake of completeness, methods must be mentioned without being fully explained, the difficulty of conveying to the student a right perspective is a real one; it has not been overcome in every place, but probably the students' text-book can be made immune from criticism on this score. The student will not get his values very far out by reading this book, for it reflects faithfully, and almost uniformly, the considered judgments of leading British surgeons.

## Practical Anæsthesia

By the Anæsthetic Staff of the Alfred Hospital, Melbourne. Australasia Medical Publishing Co. 1933. Pp. 249. 7*s*. 6*d*.

THIS little book is the first of its kind that we have met; each chapter is from the pen of a different author writing on a branch of the practice with which he is specially competent to deal. The result is that the chapters are concise, dogmatic, and full of practical directions likely to be of the greatest service to students and house officers. The book is not intended for the specialist and it scarcely touches on theory or even on physiology. Each chapter is followed by a short bibliography, with which the only fault we have to find is that it is completely American, even when the methods dealt with were first made known by British workers. One of the most valuable chapters relates to anæsthetic mortality, the available statistics being examined and assessed at their proper values. In an earlier chapter is excellent advice which might with advantage be laid to heart by some anæsthetists in London schools. It says that the student should be taught to practise giving the ordinary "rag and bottle" anæsthetic until he is thoroughly efficient in this simplest of anæsthetic techniques, and only then be allowed to attempt the more complicated methods and apparatus. We do not agree with every rule laid down; for example in the presence of respiratory obstruction we believe chloroform and oxygen is sometimes a safer anæsthetic than nitrous oxide. Nor have we as much faith in hard-and-fast tests of pre-operative risk and of shock as is here expressed. But taken as a whole we regard the book as a valuable and reliable guide for any young worker in anæsthetics. It is the first of a series of monographs from the Baker Institute of Medical Research.

## Sexualpathologie

By Prof. V. KAFKA. Leipzig und Wien: Franz Deuticke. Pp. 170. M.6.

THESE lectures were delivered to students of the medical, legal, and philosophical faculties in Hamburg. Prof. Kafka has succeeded in giving information about the various forms in which sexual activity may manifest itself without becoming lost in detail or entangled in ethical and scientific problems. The presentation is concise, matter of fact, clear, and free from dubious speculation; the author is a psychiatrist and shows an appropriate grasp of the setting of sexual behaviour, whether "normal" or not. The opening chapter deals with variations and substitutions that can hardly be regarded as abnormal, though far from universal, e.g., vaginismus, ejaculatio præcox; a chapter on masturbation follows, and then a lengthy one, occupying the greater part of the book, on the pathological forms of sexuality, differentiated according to whether or not they have a recognisable somatic foundation. The subdivision then is into quantitative and qualitative disturbances. The pathological forms found in the insane and in criminals are discussed, and a chapter on social and legal aspects of the subject concludes the book.

## Recent Advances in Plant Physiology

Second edition. By E. C. BARTON-WRIGHT, M.Sc. Lond., F.R.S.E., Chief Assistant at the Scottish Society for Research in Plant Breeding. London: J. and A. Churchill. 1933. With 54 illustrations. Pp. 341. 12*s*. 6*d*.

IN this edition Mr. Barton-Wright has not only brought his subject matter up to date but has wisely taken the opportunity of recasting the book and eliminating a good deal of some descriptions of controversial work. There are now nine chapters, of which the first, entitled Adsorption of Water and Transpiration, contains a digest of the two first chapters of the earlier edition. Then follow two chapters on carbon assimilation and nitrogen metabolism which, apart from a few minor additions, are essentially the same as before. Chapter IV., on the raw materials of plant nutrition, is entirely new and gives a summary of the significance of the various elements occurring in plants. The next chapter, entitled Transpiration, gives a very full account of the valuable researches of Mason and Maskell on the transport of carbohydrates, nitrogenous products, and salts in the plant. Chapter VI., on respiration, is little altered. In the last three chapters devoted to growth, the text has been almost entirely rewritten. The last section, dealing with accessory growth factors and related problems, is likely to be of most interest to our readers giving as it does a summary of the work done from the botanical side on auximones, hormones, and similar bodies.

THE LANCET

*LONDON: SATURDAY, OCTOBER 7, 1933*

## EPIDEMIC ENCEPHALITIS RETURNS?

THE news of a serious outbreak of encephalitis in the city and county of St. Louis is disquieting. Though sporadic cases of the disease known as encephalitis lethargica (sleepy sickness) are still being notified in many countries, no epidemic outbreak comparable in severity or extent with those which occurred during and shortly after the war has been recorded within the last few years. There was reason to hope, therefore, that its epidemicity had ceased, and as the term encephalitis includes many conditions of different origin and significance, the early reports of the illness at St. Louis were naturally treated with reserve. From the details at first available [1] it was impossible to form an opinion about its real nature, but much further information has now been given by Surgeon A. P. LEAKE,[2] of the United States public health service, who is in charge of the investigation. It appears that during the five weeks August 7th to Sept. 10th 656 cases of encephalitis have been reported in St. Louis city and county—an incidence of about 1 in 1000 of the population. The case-fatality rate has been about 20 per cent. Nearly two-thirds of the cases were in persons of 35 years of age or over; a quarter in persons between 15 and 34; and the small remainder (13 per cent.) below this age. The recovery-rate in the younger groups has been relatively high compared with the older. The case-fatality in the oldest group (55 and upwards) has been much the highest.

Clinically the outbreak has resembled other epidemics of encephalitis in its general features. As a rule the onset is fairly sudden with more or less general febrile symptoms which usually acquire definite nervous characters within two or three days; sometimes nervous symptoms are the first indication of disease. Disorders of sleep and oculomotor disturbances, which were so often the cardinal diagnostic symptoms in former epidemics, have not been common; on the other hand, demonstrable involvement of the meninges, rare in previous outbreaks, has been almost constant in the recognisable cases. The neck usually becomes definitely stiff at some stage; the cells in the spinal fluid are more numerous than normal, chiefly lymphocytes; lumbar puncture often relieves the headache permanently; transient paralyses have been noted. The mental changes are those of confusion, stupor, or even coma rather than lethargy and sleep. Recovery when it takes place does so more promptly and completely than it did in previous outbreaks. As regards the pathological lesions, LEAKE states that they "are similar in nature to those found in other epidemics of encephalitis (not the post-infectious demyelination encephalitis), but are more diffuse through the brain and meninges without special localisation in the basal ganglions and brain stem." Animal inoculations have been made with material of various kinds from acute cases, and significant symptoms have been obtained. In three monkeys, thus inoculated, lesions were found in the central nervous system "consistent with the picture found in human epidemic encephalitis." These and other experimental observations are, however, still in progress, and it will be some time before any definite deductions from them are permissible.

At the present stage it would be unwise to offer any decided opinion whether the St. Louis outbreak is or is not a recurrence in epidemic form of lethargic encephalitis. In at least three respects there are slight but definite points of difference: these are first its seasonal incidence; next its age-incidence and age-mortality; and thirdly, the distribution of nervous symptoms. In the previous history of this disease it has been remarkable how constantly, in almost all countries, the outbreaks could be looked for in or about the first quarter of the year. In this respect the St. Louis outbreak is not true to type; on the other hand, it cannot be described as unique, for there was an outbreak of some magnitude in Poland in August, 1922, and there have been others during the summer months in Japan between 1924 and 1927. Further, the age-incidence in the present epidemic, and the high case-fatality in older persons, although in strong contrast with those in most other outbreaks, bears a somewhat close similarity to those of the Japanese summer epidemics. The comparative rarity of disturbances of sleep and of the oculomotor apparatus, together with the almost constant presence of meningeal symptoms, are obviously the opposite of previous experiences. But here again it is necessary to be cautious in jumping at conclusions from a difference in symptomatology alone; for the successive outbreaks of a decade ago showed striking differences in the grouping of their nervous symptoms.

LEAKE inclines to the opinion that the St. Louis outbreak, in its clinical aspect, resembles most closely the one which appeared around the Inland Sea of Japan in 1924. This differed in so many ways from other outbreaks of encephalitis in that country that R. KANEKO and Y. AOKI [3] were led to distinguish two types: (*a*) occurring in the winter months, and clinically like the European type; and (*b*) occurring in late summer, and differing in various ways from the form hitherto seen in Europe or the United States. Such a clear-cut difference between the two types is not, however, accepted by all authorities. Whether there are in fact two types and whether this distinction is one of real importance from the

[1] See THE LANCET, Sept. 16th, p. 670.
[2] Jour. Amer. Med. Assoc., Sept. 16th, p. 928.
[3] Ergebn. d. inn. Med. u. Kinderheilk., 1928, xxxiv., 342; Japan. Med. World, 1925, v., 237.

point of view of prognosis can only be known with certainty when time has elapsed and one can see what, if any, later manifestations develop. It is sincerely to be hoped that there may prove to be such differences, and that one of them may be the absence of those later manifestations which Type A certainly leaves in its trail. Meanwhile the skill and resources of the United States public health service are being brought to bear on the various problems to which the outbreak has given rise, and we must trust that in this way knowledge will be acquired which will help to make such happenings preventable.

## ACADEMIC FREEDOM

IT would not be easy to exaggerate the debt English universities owe to German inspiration. A century ago our ancient universities, still hampered by obsolete religious "tests" did nothing whatever for the encouragement of the biological sciences, hardly anything for the chemical sciences, and even faltered in their cultivation of the ancient liberal arts. "What is done here for the classics?" asked Peacock's character, the Rev. Dr. Folliott, at Oxford in 1831, "Reprinting German editions on better paper. A great boast, verily! What for mathematics? What for metaphysics? What for history? What for anything worth knowing? This was a seat of learning in the days of Friar Bacon. But the friar is gone and his learning with him." Peacock was not an unbiased judge, but Mark Pattison's reminiscences of Oxford in the 'thirties are not much more complimentary. Some 20 years earlier a few great Germans, led by HUMBOLDT, began to rebuild the academic life of their country on the basis of complete intellectual freedom. In their view a university was the temple of a religion, the ethic of which was the pursuit of knowledge for its own sake, the qualifications for its priesthood, intellectual ability and honesty of purpose. Within a generation the least of the German universities was doing more for science and scholarship than Oxford and Cambridge together had been doing at the beginning of the nineteenth century. Our grandparents were not slow to learn the lesson. The ancient universities were changed more between 1850 and the present time than from the renaissance to the nineteenth century. Dr. Folliott, of 1931, would find much more to admire in Oxford than the friar's nose which his predecessor greeted as "the only thing to which I shall take off my hat, in all this Babylon of buried literature." Other universities have grown up which can sustain a comparison with their elder sisters and with the new foundations of the Humboldt era, Berlin, Breslau, Bonn. For this great revolution we have to thank not slavish imitation of German academic organisation but reconstruction in the spirit of HUMBOLDT'S work, the spirit of intellectual freedom.

From HUMBOLDT'S own country this spirit has temporarily departed; other tests than those of intellectual ability and honesty are now imposed on university teachers. We who were academically the pupils of the Germany of HUMBOLDT have now the duty of trying to repay part of the debt we owe by keeping alive the religion which inspired those who inspired us. As members of the senior secular faculty, medical men are in a special manner guardians of the intellectual rights of humanity. No science has been more hampered by ignorance and prejudice than that of medicine. There are still in all countries many who would, if they could, make medical research impossible. From the moment that the idea of *any* tests or qualifications for university teachers other than those of ability and intellectual honesty is entertained, decay must begin. There is not perhaps much danger of a racial, hardly more of a political, test being imposed in our universities. There is danger of *practical* tests. "Cleverness, talent, skill, fluency, memory, all these are understood and rated in the market. A cultivated mind just because it is above all price is apt to be overlooked altogether." To many of us it seems that this warning of Mark Pattison has already been forgotten by various reformers of medical curricula, and not invariably remembered by the patrons of applied research.

For these reasons the ostensibly abstract ideal of academic freedom seems to us one of the most practically important things in the world. In THE LANCET of May 27th we referred to the newly constituted Academic Assistance Council,[1] formed to help those scholars and men of science who on racial or political grounds have been deprived of their means of living in their own countries, to continue elsewhere work which civilised peoples used to think should be unhampered by political or racial considerations. The executive committee of the Council, upon which the medical sciences are represented by Prof. MAJOR GREENWOOD, F.R.S., Prof. A. V. HILL, F.R.S., and Prof. CHARLES SINGER, are faced with a colossal task. There are already on the records of the Council the names of nearly 1000 men and women who have either been deprived of their teaching and research posts or are in imminent danger of dismissal. Of these more than 420 are full professors in universities or teaching institutions of university rank, many of them investigators who have already done work of great importance. The fact that in this list the medical profession is strongly represented is not the only reason why we commend the work of the Academic Assistance Council to the notice of our readers and all whom our readers can influence. The issue at stake is more serious even than that of the hardships inflicted on our professional colleagues. If we do *not* honour abstract science and pure scholarship, not merely in prize-day orations but by deeds—and we can hardly honour them more acceptably than by helping distressed scholars and investigators—applied science will very soon cease to be science at all. To members of a learned profession these considerations must be of paramount importance.

[1] The hon. secs. of the Academic Assistance Council are Sir Wm. H. Beveridge and Prof. C. S. Gibson, F.R.S., and its offices at the rooms of the Royal Society, Burlington House, London, W.1.

## THE FLEXIBLE GASTROSCOPE

THE history of gastroscopy is the record of a sustained effort to overcome difficulties which appeared to be almost insurmountable. When Nitze had perfected the cystoscope it seemed to be a fairly simple problem to adapt the principle of its construction to the visual inspection of the interior of the stomach, since the course of the œsophagus is much nearer a straight line than that of the urethra. Yet the fragility of its walls and its inadaptability to change of direction was found to render the introduction of a straight tube a dangerous procedure. More than 50 years ago, however, Mickulicz was actually able to see a carcinoma of the stomach through a tube introduced down the œsophagus. From that day to this, enterprising surgeons have never ceased striving to make the method safe; noteworthy amongst the enthusiasts were Rosenheim, Kelling, Kuttner, Schindler, Sternberg, Korbsch, and in this country, William Hill. By reducing the calibre of the instrument, by making a flexible tube that could be straightened mechanically after introduction, by affixing a soft flexible extremity, and by other means advances were made towards the goal, but no real success was attained until the remarkable work of Schindler and Wolff reached fruition about a year ago. The situation at that time is well described by Prof. K. Gutzeit, of Breslau,[1] who writes an account of his experience of 1200 gastroscopies. In the hands of a few experienced technicians using the utmost care gastroscopy with the instruments then available was not only permissible, but indeed well worth while in suitable cases. The beautiful optical and electrical arrangements enabled the aspects of the interior of the stomach in various states of disease to be mapped out with exactitude, and these records are of permanent value. But most surgeons held that the method carried an unjustifiable risk. Many accidental perforations, even in skilled hands, had occurred at the upper end of the œsophagus or just where it turns through the diaphragm.

There the matter stood until that indefatigable gastroscopist R. Schindler, working with an optical physicist, Julius Wolff, invented an entirely new optical system.[2] The lower part of the new gastroscope for about 12–15 inches is composed of a flexible rubber-covered tube containing a row of biconvex lenses in contact. By this remarkable arrangement an image is obtained even when the axis of the tube is bent into a very considerable curve. The instrument can be passed with as little distress to the patient and as little danger as an ordinary sized stomach-tube. The operation is carried out after cocanisation of the pharynx with the patient in the left lateral position. The stomach is irrigated until it is clean, and then inflated with air for inspection. To an observer unaccustomed to using the rigid Schindler instrument the image appears remarkably clear and bright, but the experienced gastroscopist can detect a little distortion and he also notices some diminution of illumination—not surprising considering the make-up of the optical system.

Thus what appeared impossible has been achieved. The operator is able to look round a bend with a flexible optical instrument, the light rays being deviated at will to reach the observer's eye. One other great advantage has been claimed for the flexible instrument. As the rubber tip reaches the greater curvature of the stomach it is deviated along this curve so that a view of the pylorus is obtainable in cases in which such a view could not possibly be had with the rigid instrument. This is because with the flexible instrument the field of view is not encroached upon by the lesser curvature which may obscure the pylorus when the rigid tube is used and has caused difficulty in obtaining complete pictures with intragastric photography. It seems likely that the new instrument will be widely used. All the pioneer descriptive work has already been done, and, with very little experience and the use of existing atlases, confidence in diagnosis should soon be attained. The results of such experience will eagerly be awaited in this country, particularly the question of whether an early diagnosis of carcinoma can be made, this being the gastric lesion where radiography fails more often than in any other. It may also be hoped with confidence that the problem of gastritis and its relation to the various dyspepsias may now shortly be disentangled from the chaos into which it has fallen.

[1] Med. Klin., 1933, xxix., 965.
[2] Münch. med. Woch., 1932, lxxix., 1268.

## THE MEDICAL WITNESS

MEETING at Johannesburg last June to hear and discuss a frank and friendly paper on the Medical Witness, the medical practitioners of the Southern Transvaal were not spared certain home truths.[1] The learned advocate who read the paper said that, in his experience both in the law courts and in extra-judicial proceedings, doctors were prepared to testify to medical facts somewhat lightly. He added handsomely that this fault was by no means confined to doctors and that it often arose from the noblest motives. He had been struck with the facility with which both sides in a case could produce an abundance of conflicting medical testimony as to the existence or non-existence of a particular disability or as to the cause where the existence was admitted. He gently referred also to the fact that the medical profession itself has occasionally to remind its members of the impropriety of lax certification. These considerations, he thought, justified the legal preference for oral cross-examination as a means of arriving at the truth and its reluctance to rely on written statements. Documentary reports, he observed, cannot always be sure of dealing with the relevant issues of litigation since the issues are often not crystallised until the trial is nearly completed.

Dr. JOSEPH J. LEVIN, initiating discussion on the points covered by the paper, conceded that doctors are notoriously bad witnesses, though he kept up his hearers' spirits by adding that lawyers were very ignorant of everything pertaining to

[1] South African Med. Jour., August 12th, p. 499.

the practice of medicine and the art of surgery. Doctors, he said, ought to be taught how to answer questions about what they really do know, and lawyers how to ask questions about what they really do not know. Dr. Levin reiterated his advice to medical students not to be ashamed of answering "I do not know" except when questioned on matters of fact. The learned advocate, by-the-by, had previously suggested a useful variant of this formula—namely, "That is a question I should like time to consider." Dr. Levin went on to quote an authority on medical jurisprudence who tells his readers that most medical men enjoy being called into court to testify as experts. They feel it an honour and a compliment to give evidence in this capacity. If they have no special knowledge of the subject, either they will boldly qualify as expert witnesses by reading up the matter hurriedly in the few days before the trial, or else they will enter the court unprepared for questions put by cross-examining counsel who have been fortified by consultation with real experts. In either case professional ignorance may be exposed to judge and jury. It is not improper to claim expert knowledge of special subjects, but there need be no loss of professional standing in disclaiming the possession of special knowledge. "Eminence is not arrived at in a day, nor without labour"; while we can expect average skill from the general practitioner, we have the right to expect the highest kind of knowledge from the expert.

Some of the points covered by the discussion were familiar enough—the legal view of medical privilege, the practice of calling a doctor as a witness of facts and then extracting from him the opinions of an expert, the use of medical assessors and the possibility of having experts called by the court instead of by the parties. In England the "new procedure" of the High Court offers some opportunity of pooling expert evidence and making it available for both sides before trial, but only scant use has so far been made of this facility. A Chancery judge remarked not long ago that he hoped the time would soon arrive when the evidence to be given by an expert witness would be shown to the opposite side before trial. Other Chancery judges have attempted to limit the number of experts to be called on either side. One of the Official Referees at the law courts frequently invites the parties to agree to abide by the opinions and conclusions of a neutral expert to be appointed by the court. Such a course saves much time and expense in cases where masses of figures and details are in question. These are straws which show which way the wind blows, but we are still some way off the prospect of a universal system of medical referees to relieve the judges of discriminating between the conflicting testimony of medical experts. Judicial independence is jealous of suggested delegations of judicial authority. The Workmen's Compensation Acts represent perhaps the furthest limits to which such a system can as yet be carried.

# ANNOTATIONS

## IMMUNISATION AGAINST DIPHTHERIA WITH A SINGLE DOSE OF ANTIGEN

THOUGH the routine methods of active immunisation against diphtheria are very much as they were five years ago, a number of experimental advances have taken place which must sooner or later modify current practice. The main desiderata in diphtheria immunisation are that the number of injections should be cut down to a minimum (preferably to one injection) and that the preparations used should cause no disturbance, local or general, in the persons injected. These two requirements are unfortunately not easy to reconcile. Antigens of high theoretical potency can now be prepared, but in achieving high potency there is, ipso facto, an added tendency to produce undesirable reactions. Some of the factors responsible for reactions must be closely related if not identical with the antigenic principle itself, since methods of purification which eliminate upwards of 90 per cent. of the non-antigenic constituents of toxin or toxoid fail to provide us with a material which may be relied upon not to produce reactions. It is an old view that antigenic potency can be estimated by the combining power of toxin or toxoid with antitoxin. The Ramon flocculation method which provides a convenient means of estimating the combining power of toxoid has been of the greatest assistance in the preparation of high value antigens. Ramon constantly stresses in his writings the importance of using antigens having a high flocculation value. Pope and his colleagues [1] have succeeded in preparing unpurified toxins and toxoids many times more potent than those available a few years ago, and other workers have used chemical methods of purification to prepare antigens of hitherto undreamt-of potency. The present problem is not so much to prepare high value antigens as to use them.

Improvements in the technique of preparation of antigens have led to improvement in the practical immunisation of human beings, but by no means to the extent which at first sight might be expected. Active immunity depends quite as much on the proper application of the antigenic stimulus as on the intrinsic potency of the antigen and a single dose of an antigen, however high its Lf. value, does not readily cause the development of a significant active immunity. By the use of preparations which are slowly absorbed such as toxoid-antitoxin floccules (T.A.F.) or alum toxoid, it is possible to maintain a more or less continuous antigenic stimulus, and the results obtained with such materials have been very promising. A material, however, which resists tissue absorption is also likely to act as an irritant, and alum-toxoid, at least, is in the position that while it is theoretically a much better antigen than those in current use it is too irritating for routine employment. T.A.F. still probably remains the best all-round reagent for active immunisation, but it is difficult to prepare and costly. Recent workers both in this country and abroad have been experimenting in the direction of cutting down the number of injections in immunisation. Ramon and his colleagues [2] and M. Nicolle [3] have recently reported successful results

[1] Jour. Path. and Bact., 1932, xxxv., 573.

[2] Bull. Off. Internat. d'hyg. pub., 1933, xxv., 1405.
[3] Compt. rend. Soc. de biol., 1933, cxiii., 1467.

with two doses of toxoid, and indeed it ought to be possible even with current commercial preparations to immunise with two doses if proper care is taken in timing the injections. Quite lately a number of observers have reported the successful use of one injection. C. Jensen,[4] using a single dose of an alum-concentrated toxoid containing 150 Lf. per c.cm., succeeded in immunising 20 out of 21 children within a month. C. Terni [5] in Italy has reported the successful immunisation of 77 per cent. of 323 children treated with one dose. In America Graham, Murphree, and Gill [6] were successful in 92·4 per cent. of cases, and more recently H. W. Straus,[7] using a purified toxoid incorporated with lanoline, succeeded in rendering 99 per cent. of 103 subjects immune within two months of a single injection. Much more work, no doubt, must be done before a "one injection" immunisation against diphtheria can become a routine measure, but these results encourage us to think that considerable improvements in routine methods are in sight.

## SPECIAL DISABILITY IN WRITING

KNOWLEDGE of the association mechanisms of speech and related functions is still far from complete and the anatomical loci of these functions are still indefinite. Dr. Samuel T. Orton of New York has given much time to clinical study of these functions and particularly of their pathological aberrations, and he is now the joint author with Miss Anna Gillingham of an article published in the *Bulletin* of the Neurological Institute of New York dealing specifically with abnormalities in writing. Dr. Orton has, in previously published work noticed in these columns,[8] suggested that failure to achieve unilateral dominance, which must be regarded as the normal adult condition, accounts for retardation in learning to read in children otherwise intelligent, and this new study hints at a similar conclusion with regard to writing incapacities. A small proportion of the cases described are, it is true, otherwise explicable. In one group there is evidence of damage to the pyramidal or pre-pyramidal motor system, so that the writing incapacity is only part of a more general motor dysfunction. An interesting group is made up of those who, being left-handed, have been taught to write with their right hands while still using the left for other activities—a policy successful in some instances but not in others. When unsuccessful, transfer of the training to the hand which the child naturally uses resulted in great improvement. The authors are not prepared to say whether in every case the left-handed child should or should not be trained to write with the right hand, but they are obviously impressed by the difficulty, both in speech and writing, caused in certain cases, and they suggest that a child failing to attain legibility or speed with the right hand should certainly have the left hand trained. An indispensable condition is that in the training of the left hand the position of the paper and the slant of the letter-axis in writing should be considered—points, they allege, which are too generally forgotten. The largest group, however, consists of children in whom the fundamental element is delay or failure to acquire a definite unilateral dominance. In some of these there were also reading and spelling difficulties, in others stammering, and in still others difficulty in acquiring other complex motor patterns as well as writing—a congenital apraxia. Essentially they are children intermediate between pure dextrals and pure sinistrals—cases, that is, of incomplete dominance of either right or left—so that they may show crossed patterns of handedness and eyedness, e.g., they may be left-handed and right-eyed. The writers conclude with a reminder that the presence of these or other defects in language faculty may be isolated phenomena and should not be made the basis for an unjust estimate of a child's general capacities.

[4] Ibid., 1931, cviii., 528, 532, and 543.
[5] Ann. d'Igiene, 1932, xlii., 589.
[6] Jour. Amer. Med. Assoc., 1933, c., 1096.
[7] Ibid., July 15th, p. 192.
THE LANCET, 1928, i., 1133.

## ÆTIOLOGY OF PERINEPHRIC ABSCESS

IT is recognised that suppuration in the fatty tissue which surrounds the kidney outside its capsule proper—i.e., in the so-called perinephrium—may have two possible sources of origin. It may be due to a direct spread of suppuration from a septic focus in the kidney or from inflammation of a retroperitoneal organ, such as a retrocæcal appendix; or it may be embolic in origin, the so-called "primary" type of perinephric abscess. Certain writers on the subject, notably V. C. Hunt,[1] have tried to establish the view that suppuration in the perinephrium is never "primary" in the generally accepted sense of the word, but that in cases exhibiting no symptoms referable to the kidney and recovering completely after simple drainage of the abscess, the source of infection has been a cortical renal abscess rupturing into the perinephrium. Since this variety of perinephric abscess tends to clear up promptly when drainage has been established very few cases come to autopsy, and it is extremely difficult to decide its origin. As V. Vermooten [2] points out in a recent paper, there can be no doubt that cortical abscesses in the kidney do occur and do rupture. He cites one case of his own and 26 cases reported by Hunt. Nevertheless Vermooten is convinced by a series of personal observations, clinical, anatomical, and pathological, that suppuration in the perinephrium is often a definite disease entity and, apart from the fact that the perinephrium surrounds the kidney, need have no relation to the kidney. His one fatal case, in a series of 11, showed at autopsy both kidneys surrounded by pus but intact and without evidence of cortical infection. Vermooten believes that here a staphylococcal bacteræmia has led to metastatic staphylococcal abscesses by embolic infection of the end arteries of the perinephrium; branches to the perinephrium from the renal, lumbar, and phrenic vessels, and an occasional branch from the mesenteric artery have been traced. Vermooten would like to distinguish the two types of suppuration by reserving the term perinephric for the abscess spreading by direct infection from the kidney or other neighbouring organ; the "primary" or embolic abscess he would call perinephritic. The two terms are so much alike, however, and have been for so long interchangeable, that it is doubtful whether any useful purpose would be served by such a differentiation in their use. On the other hand, the distinction between the two types of lesion has great clinical importance, and a nomenclature that would emphasise this distinction would be all to the good. The important points in the differential diagnosis of suppuration spreading from the kidney are the presence of pus in the urine, the persistence of suppuration after drainage, possible sinus formation, and evidence of calculus or of tuberculous infection of the kidney on the infected side. The so-called primary type of perinephric suppuration, whatever its ætiology may be, is a clinical entity

[1] Jour. Amer. Med. Assoc., 1924, lxxxiii., 2070.
[2] Jour. Urol., 1933, xxx., 2.

with a far better prognosis than the other type. It has a very much lower mortality, requiring simple drainage in place of possible nephrectomy or a difficult appendicectomy, and is practically never followed by prolonged sepsis.

## THE NEW PHARMACY

THE interesting collection of fine old drug jars on the stand of an old-established firm at the Chemists' Exhibition, at the new Horticultural Hall at Westminster, led one to reflect on the great change which has come over pharmacy in, say, the last half century. A continental visitor would have wondered where the chemist's part came in. Certainly some firms showed pure organic chemicals which are used as drugs, but apart from the purely British significance of the word "chemist" there was very little which the older type of pharmacist or druggist could recognise as belonging to his art. Although drugs and galenicals still occupy an important place in the pharmacopœia, the modern tendency is for them to be supplied like most of the newer preparations in factory packed and convenient units; hence glass-bottle makers and makers of other "elegant" containers show their wares at such exhibitions. The ancient connexion between barbers and surgeons is perhaps perpetuated by the exhibition of safety razors. Some modern tendencies in prescribing are reflected in the preparations of halibut-liver oil, which is more active than that of its cousin the cod, and in the addition of glucose preparations and toffees shown by some firms. The art of the perfumer and the beauty specialist figures largely in modern "pharmacy," and one large but discreet stand was devoted to anti-fertility rites. An ingenious device for re-setting clinical thermometers was shown by a firm of thermometer makers. It consisted of a simple pocket centrifuge based on the principle of the Archimedian drill, and should be useful for dealing with these rather troublesome instruments. The exhibition as a whole, whilst it showed how little of his art the modern pharmacist need practise, showed also the greater certainty and cleanliness that the modern methods of preparation and packing of medicinal materials have brought in their train.

## EUGENIC STERILISATION IN SWITZERLAND

THE first of the United States of America to pass a sterilisation law was Indiana, in the year 1909. The first of the cantons of Switzerland to pass such a law was Vaud, in 1930. But it is not to be inferred from this that sterilisation in Switzerland has only been performed for the last three years. According to Prof. Hans Maier, director of the Burghölzli Mental Hospital, at Zurich, who, on Sept. 28th, gave an address on the subject at the Royal College of Surgeons of England, sterilising operations have been carried out in Switzerland for the last 50 years. Apparently the legal position in Switzerland and in this country differs in that Switzerland has no provisions of special acts relating to lunacy and mental deficiency which render such operations illegal for persons concerned in these acts. In most European countries, laws relating to offences against the person seem to be generally similar. According to these, operations upon the human body are regarded as within the law when they are performed with a therapeutic aim. In Switzerland the term "therapeutic" seems to be widely interpreted as applying not only to the welfare of the individual, but also to that of the community as a whole. Considerations of social and racial hygiene are, in Switzerland, held to fall within the meaning of the term "therapeutic," and therefore to justify a sterilising operation. Feeble-mindedness—an elastic term which is interpreted in Switzerland somewhat more broadly than according to the legal definition it has received in this country—and schizophrenia were the conditions for which Prof. Maier regarded sterilisation as most appropriate. Before sterilising a person for a eugenic purpose, it is usual in Switzerland for a surgeon to demand two medical certificates from two competent physicians stating that the subject is a fit candidate for the operations. Sterilisation is not indiscriminately performed on all persons to whom a given diagnostic label has been attached. Against this practice several forceful objections may be adduced, of which the most important is that a strong prejudice may be aroused against institutional treatment if it is thought that sterilisation is an inevitable sequel to commitment. Such an attitude is especially justified when the measure can be compulsorily applied. In Switzerland sterilisation is at present voluntary in the sense that it cannot be applied to an unwilling subject. Furthermore, it is carried out selectively, the merits of each case are, it is stated, carefully discussed and the pros and cons of sterilisation are separately considered. It is not believed that every sufferer from a given form of mental defect or disorder is, from the mere fact that a particular diagnosis has been made, a suitable candidate for the operation. If the sterilisation of mental defectives is ever legalised in this country, there is little doubt that it will be performed along lines resembling those which govern the practice in Switzerland.

## THE DIABETIC MOTORIST

THE recent case of a motorist, who pleaded guilty to the charge of driving while under the influence of a drug (insulin) is of great importance to the large number of diabetic patients who drive cars with perfect safety. Its medico-legal aspects were discussed in THE LANCET last week. Its clinical lessons remain to be emphasised. The defendant in the case was saved from death in diabetic coma in May, 1923, by insulin, then only recently made available in this country, and had remained in good health ever since, although his insulin requirements had increased slowly for some years, and rather rapidly for one year. During these years he had often had slight symptoms of hypoglycæmia, and treated them at once with sugar. It was stated in court that a year ago he had discussed with his medical adviser the question of hypoglycæmic attacks occurring while he was driving, and had given an assurance that he was able to recognise their onset quite easily, and stopped driving until he had felt better, after taking sugar. In the present instance, when he failed altogether to recognise the symptoms, he had three months previously, under advice, increased the dose of insulin very considerably; in the last few weeks he had begun to have signs of hypoglycæmia, and had reduced the dose by 20 units.

It is noteworthy that the majority of patients who take insulin do recognise the symptoms of hypoglycæmia and act accordingly; but a minority never do so, and are thus always a potential danger to themselves and the community. They may suffer from fits, hemiplegia, a condition similar to drunkenness, or pass, as this man did, into a state of automatism. A patient who is liable to pass into this condition is clearly unfit to have a driving licence, and should not apply for one. There remains a very small group, the members of which appreciate, as a

rule, the symptoms of hypoglycæmia, but on very rare occasions do not recognise their onset. This is more likely to happen if the patient is absorbed in some distracting work or activity, such as driving a car which takes his attention from his physical sensations. To deprive this group of patients of their licences seems hard lines, although in the public interest no exception can be taken to this course.

It is possible that the advice which is often tendered to patients under insulin therapy who want to bathe might be of assistance to diabetic motorists. An attack of hypoglycæmia on dry land is not feared by most patients, but an attack while swimming in deep water might be very serious; further, the exercise itself leads to the utilisation of a good deal of sugar, and thus renders the patient more liable to hypoglycæmia. Since the morning dose of insulin is usually taken rather early, and three hours may well have elapsed after the injection before the patient is on the beach, it is a good rule to avoid bathing altogether until after lunch. In any case it is advisable for the patient to eat at least 10 g. of carbohydrate before entering the water, so as to prevent the blood-sugar becoming too low. Similarly, diabetic patients would be well advised not to drive a car in the latter part of the morning, and if they have to for an urgent reason, should always eat some extra carbohydrate before starting. They ought not to continue to drive when the usual hour for the midday meal is passed.

## INTESTINAL KNOTS

Knot-formation is one of the rarer causes of intestinal obstruction. K. E. Kallio,[1] who has recently published a detailed study of the condition, has been able to collect only 84 cases from the literature, to which he has added 77 hitherto unpublished cases from the hospitals of Finland. He draws attention to the curious fact that cases reported from Finland greatly outnumber those from all other countries; in addition to his own cases, 45 of those previously published are of Finnish origin, i.e., over 75 per cent. of the total number of cases (161).

Knotting may take place either between two freely movable loops of bowel, if these become spirally twisted around one another in opposite directions, or by the twisting of a single loop upon itself in the form of a sailor's knot. The latter kind is extremely rare; Kallio has been able to find only one reported case. The former type falls into two classes: knotting of (1) small with large intestine, (2) two loops of small intestine. The type of knotting in which the large intestine takes part is much the more common. Of the two situations, sigmoid and cæcum, where knotting occurs, the cæcum is very rarely involved (2 cases). The sigmoid group, on the other hand, includes the majority of all cases of intestinal knotting (83·2 per cent. of the present series). Knotting of the transverse colon with the sigmoid is theoretically possible where both are long and mobile, but no case was found on record.

The exact mechanism of the accident is obscure. Three factors appear to facilitate its occurrence: advancing age and loss of fat; an unusually long intestine and mesentery; abnormally short parietal attachment of the sigmoid mesocolon and fixation of the terminal ileum. Kallio believes that the relatively high incidence in Finland, among the poorest of the working classes, is accounted for by their habitual diet, which is chiefly vegetable, large in bulk but small in nutritive value, combined with a length of bowel which he states, on the authority of Wallenius, to be above the average for other nations. The meteorism which such a diet is apt to produce would tend to occur particularly after the largest meal of the day—among working men the evening meal—which may explain the fact that the onset is almost invariably during the night. The fact that 90 per cent. of the patients are men is ascribed to the more generous dietary and greater average length of intestine in the male. The author suggests that the mode of development in the commonest (ileo-sigmoid) type may be that the sigmoid, filling with gas and aided by the recumbent position, rises out of the pelvis into the abdomen, where it lies in contact with coils of small bowel. A sudden movement of the body brings a loop of ileum across the sigmoid, and a further movement, or strong peristalsis, causes it to twist round the latter. The process once started is progressive, peristalsis and distension combining to draw the knot tighter and tighter.

The symptoms are those of an acute intestinal obstruction rapidly progressing to gangrene and peritonitis. The patient's general condition quickly deteriorates and is often desperate by the time that he comes under treatment. The total mortality of all the cases was 67·2 per cent. This is more than double the figure, estimated by Rowlands and Turner as 32 per cent., the average mortality-rate for all forms of acute obstruction (strangulated external hernia excepted) in seven large British hospitals. Kallio lays stress on the necessity for careful preoperative preparation. He advocates general rather than local or spinal anæsthesia. Reduction is first attempted and is facilitated by puncture of one or both of the distended loops. If it proves impossible, the whole mass must be resected. Once the knot is undone the question of viability must be decided, and "it is better to err on the side of pessimism." The exact treatment to be adopted when gangrene is present must of course be determined in accordance with the general principles of intestinal surgery.

[1] Acta Chirurgica Scandinavica, 1932, lxx., Supplement XXI.

## A COMBINED RADIO SET AND HEARING AID

A WIRELESS set of considerable interest to deaf persons has recently been introduced. It is a self-contained 5-valve instrument of ordinary "transportable" size, and may be obtained from the Multitone Electric Co., Ltd., at the reasonable price of 20 guineas, to run on batteries or from the mains. It is provided with a built-in moving coil loud-speaker, and is usable as an ordinary wireless, but has a tone-control device to vary the point of greatest amplification to different parts of the scale, in order to adapt the reproduction to various forms of deafness. In addition, it is provided with a "head-phone" type of telephone receiver connected to the set by means of a long lead containing an independent volume control; by this means a deaf person is enabled to listen to broadcast music, or to a gramophone plugged in to the set, and can control the loudness at the telephone receiver, while other members of the family hear the loud-speaker at a normal volume. There is a further application of the instrument. By moving a switch the loud-speaker is converted into a powerful transmitter which enables the deaf person to hear by his telephone the conversation in the room. Although, of course, not truly portable, it is a most efficient deaf-aid when used in this way, and the volume- and tone-controls render it very adaptable to individual requirements. The important claim is made that a large number of supposedly deaf-mutes can be made to hear and appreciate sounds with this instrument,

and that the broadcast programme provides an excellent means of accustoming them to speech, music, and various other sounds. If these claims can be substantiated, the apparatus will be of use to instructors of the deaf, especially in the difficult early stage of teaching the meaning and quality of sound, and should assist in the development of a natural tone of voice, for which purpose it is of great value for the patient to hear his own vocal efforts.

## THE DRUG TRAFFIC

THE work of the Permanent Central Opium Board and of the Advisory Committee on Dangerous Drugs has been under review at Geneva by the Assembly and Council of the League of Nations. It was reported that the declared figures for manufacture and stocks in hand of the drugs scheduled in the Conventions of 1912 and 1925 are gradually approaching the quantities necessary for the medical and scientific needs of the world. These it will be remembered were, according to the estimate of the secretariat of the League, nine tons of morphine, two tons of heroin, and five and a half tons of cocaine per annum. There is, however, beyond the official returns received an amount of illicit traffic which cannot be estimated. While the seizures of contraband in 1932 were, except in the case of cocaine, less than in 1931, the Central Board adds "it must not be concluded that this decrease is a result of the gradual disappearance of the illicit traffic. It may perhaps be more accurate to conclude that the centres of the traffic and the routes followed by it are changing." Thus the suppression of morphine factories in Turkey was followed by their establishment in Bulgaria. In 1932 there was a considerable increase of manufacture of morphine and heroin in Soviet Russia; Poland also has become a producing country. In the Far East a sinister development of secret factories of narcotics in China has been disclosed, while in Japan the total consumption of heroin in 1932 exceeded that of all the rest of the world put together.

## AGRANULOCYTOSIS

Dr. R. C. Beck [1] has performed a useful service in reviewing present knowledge of agranulocytosis, which he prefers to call neutropenia. He defines it as a "grave disease of unknown ætiology characterised by a marked reduction in the total number of white cells and a great reduction in the percentage of granulocytes, accompanied by aplastic, normal, or hyperplastic myeloid tissue. Following the peripheral neutropenia there may be a number of lesions and symptoms which might follow the removal from the body of such an important defence mechanism. The disease may be acute or chronic." He describes five clinical types. (1) The fulminating acute type with sudden onset of fever and necrotising angina, and possibly jaundice and albuminuria. The neutropenia is extreme, and this type is rapidly fatal, extensive necrosis of the granulopoietic system being found at autopsy. (2) The subacute type characterised by low fever, slight enlargement of glands and spleen, neutropenia, late development of a sore throat, and necrosy. (3) The relapsing type. Patients in this group have several attacks weeks or months apart. The symptoms may be fulminating or subacute, and though death may ultimately take place, there may alternatively be complete recovery or the process may become subchronic. (4) The subchronic type. The onset is insidious; the leucopenia is usually less intense, and the number of granulocytes is higher than in other types. The patients may be ill for a year and yet recover; indeed, cases of six years' duration are on record. (5) The cyclic type. These cases show a chronic regularly recurring periodic neutropenia associated with some varying degree of ill-health. The evidence available suggests that weakness, exhaustion, fatigue, and a tendency to sleep are the chief results of a depressed granulocyte count in the less acute cases. Nucleotide K. 96 is the most hopeful treatment at present, though by no means invariably successful. The ætiology of primary cases is still unknown; nor has it been explained why the disease should be commoner in Germany and America than it is in this country.

[1] Arch. Internal Med., 1933, lii., 239.

## ST. MARY'S HOSPITAL NEW MEDICAL SCHOOL

THE former students of St. Mary's Hospital who came to town last week-end for the post-graduate course had an opportunity of seeing the new medical school, which the vision of Dr. C. M. Wilson, the dean, combined with the executive ability of Sir Edwin Cooper, the architect, has created for their fortunate successors. The school will, it is hoped, be opened formally before Christmas. It is continuous with the new bacteriological department, and the new building faces the hospital across Cambridge-place, matching it in height and length. The Georgian treatment is skilfully planned to be sympathetic, and in no way disrespectful or patronising, to the honourable old building whose offspring it is. One of Dr. Wilson's ambitions was to prevent the reading-room from looking like a club, and it is furnished with deep armchairs and settees in dull scarlet leather, modelled on the most recent rectangular lines. In the refectory the dining tables are square, of weathered oak, and the chairs are upholstered in goatskin of the same colour as those of the reading-room. Students will go through the reading-room into a large gymnasium, and beyond into the gallery of a squash-rackets court with a wooden floor. Below, on a level with the courtyard and opening on to it through several large glass doors, is the swimming-bath, the water in which is purified by exposure to ultra-violet light. The library has not yet been equipped, but promises to be as complete as any in London. It is panelled in oak, with oak floor and pillars, and has a wide gallery. The courtyard is to be laid out in turf, and underneath it there will be a garage. The bath will be open to old students. The lecture-rooms are on the most approved modern pattern, and fitted with lantern and cinematographic apparatus. The first floor houses chemistry; the second floor, pharmacology, physics, and physiology; the third, physiology; the fourth, anatomy and biology. There are a considerable number of research rooms on all the floors.

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Summer Time, which commenced in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday, April 9th, will cease on Sunday next, Oct. 8th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich time.

THE pictures and furniture, for the equipment of a senior common room at University College medical school, given to the College by Sir Buckston Brown, were on view on Monday last at the opening of the winter session. A private opening of the room took place some two months ago. Sir Buckston has for many years been an assiduous collector, and this new proof of his public-spirited generosity is a testimony, by its contents, of his sound and wide discrimination.

# OPENING OF THE MEDICAL SCHOOLS

THE winter session opened this week with inaugural addresses at several of the medical schools. Below we publish extracts from several of them. Sir Gowland Hopkins spoke at Guy's, Sir Farquhar Buzzard at the Royal Free, Prof. Langdon Brown at Westminster, Prof. Hall at the University of Birmingham, and Prof. Dodds at the Middlesex Hospital.

## THE BURDEN OF FACTS

BY SIR GOWLAND HOPKINS, F.R.C.P., P.R.S.
PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF CAMBRIDGE

The great art of medicine is based upon much more than scientific knowledge alone, but if it neglects any knowledge which can extend its powers it sins against the light. It is sure, therefore, that the search for ideals in medical science teaching is not merely of educational, but of social and national concern.

In respect of the preclinical teaching any approach to an ideal should involve, as well as an adequate introduction to the facts of the ancillary sciences, the instilment of a scientific outlook, and with it the love of exact truth together with a recognition of human frailty in striving for the truth; the ability to weigh evidence and (believe me of no small importance to the doctor) a willingness to give up prejudgments and prejudices in the face of evidence. These should be the gifts of a scientific education. It is difficult enough for them to emerge from the burden of facts which we place on the shoulders of the willing student.

Although the preclinical teaching is allotted a shorter time in this country than in some others the remedy is not to be found in its extension. This would certainly be unpopular and is likely long to remain impossible. Moreover, it would probably not result in making the present teaching of facts less hurried and therefore more easily assimilated. That enemy, the specialist, as he is to be found in the universities at any rate, abhors a vacuum or even low pressure anywhere in the time-table. He would, I think, hasten to raise the pressure again.

We are, of course, engaged now in making a present of the teaching of the preliminary sciences to the schoolmaster, and this in effect is lengthening the pre-clinical years of study. But this policy cannot be pushed farther. Cultural value can doubtless be given to the teaching of these sciences, but we must not interfere any more with the wider education so essential to a liberal profession.

The teaching of science to the medical student might, I think, be made more vocational, thus leading to much economy in the facts to be memorised. Henry Poincaré, the great French mathematician and philosopher, more than once pointed out that science itself has to select the facts which it takes under its charge. "However great our activity," he wrote, "facts outstrip us and we can never overtake them. While the scientist is discovering one fact millions and millions are produced in every cubic inch of his body. Trying to make science contain nature is like trying to make the part contain the whole."

There is a hierarchy of facts, and those which science seeks are those which occur frequently in the scheme of things, and not those which occur once in a way in isolation without apparent bearing on other facts. It is the facts which unite into generalisation that are the treasures of science. Now when any pure science is to be applied its own facts and even its generalisations assume a new hierarchy, a new relative importance; and it is clear that a selection for specific application is as logical as it is ultimately necessary. With such a selection, however, teaching becomes labelled as vocational, and this raises an issue which may be viewed differently at different centres of teaching. At the two old universities, and I think at some others, there is distaste for the very sound of the word vocational. The ideal that every science should be taught to everybody for its own sake without reference to its application is doubtless a high one and worthy of respect. It should, I think, be respected however, with due regard to possibilities and to the needs of special cases. Moreover, I have always held that if the teacher has skill enough, and goodwill, the fundamentals of a science can usually be taught adequately on a basis of facts selected for their vocational value.

Doubtless, indeed, in a great medical school where preclinical science is taught in a clinical atmosphere there is no such dislike of the vocational element. If so there may be, and probably is for the student, some lightening of the burden of facts. Or this could be so if examiners were always wise. But it is true that to teach scientific principles adequately on a vocational basis requires real aptitude and special knowledge on the part of the teacher. Here perhaps we come to the root of our difficulties, and may be a dim foreshadowing of a solution. Teaching as an art is too much neglected in our centres of higher learning, especially perhaps in the science schools of the universities. Those in authority there usually reach their position because of their distinction as investigators, or for good reasons other than their ability to teach. Some few may have the faculty inborn, others lack both ability and the interest necessary for excellence. It is wholly right, indeed, that in a progressive scientific centre the claims of research should be paramount, and it would be fatal if distinguished investigators were compelled to adjust their thoughts and teaching to professional needs.

I am thinking however—vaguely, I must admit—of a possibility other than this. We know that distinguished clinicians during recent years have foregone the financial reward of practice in order to devote themselves to advanced teaching; to clinical research also perhaps, but often, in the main, to teaching. May we not hope that men of equal ability may choose an unselfish career involving a full medical training (for that would be an essential experience) and a subsequent return to the teaching of preclinical sciences, not as specialists, but as teachers capable of covering a wide ground, and presenting the facts from a standpoint which would be selective, synthetic, interpretative, and devoted to a special end? Such teachers could not be investigators as well, and could never function, of course, without public recognition of the importance of their special work, and the respect which would be its due. Here, however, I am dealing with matters on which, in Sir Thomas Browne's words, "thought should but tenderly touch"; for it is clear that finding a place for such teachers as these would present great difficulties, especially in connexion with laboratory work. I believe that most of my colleagues would think it impossible, and moreover feel that such a policy, if practicable, would be essentially bad. Nevertheless, I am as convinced now, when near the close of my career, as I was at its start, when science made less demands, that synthetic minds should somehow

intervene between the scientific specialist and the student preparing for a profession of which the basic demands cover so wide a ground.

## PREPARATION FOR MEDICAL PRACTICE

By Sir Farquhar Buzzard, Bt., F.R.C.P.
REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD

The medical curriculum is, at the present time, the subject of much violent criticism, some of which it thoroughly deserves. It is said, with much truth, that the education of the medical student is broken up into a number of departments too rigidly separated by barriers of examinations, and that the student not unnaturally fails, therefore, to appreciate the value of what she has learned in one department when she passes on to the next. It is, perhaps, easy for the student to think that each department in the curriculum is playing for its own hand, as it were, and has lost sight of the goal to which her education is directed. You may ask, and the questions are not really impertinent, "Why am I kept so long from seeing anything of living human beings and their ills?" "Why cannot I be shown at a much earlier stage how all these physical, chemical, anatomical, and physiological facts and theories, which I am asked to absorb and memorise, are applicable to my future work, and are to be of use to me when I am brought face to face with the problems of health and disease?"

And when you are qualified and have had a short experience of medical practice you may ask, again with some justice, "Why was so much of my time spent in studying disorders of the mind, seeing that half my patients need skilful understanding and wise inspiration rather than medicinal or surgical treatment?"

These few questions indicate substantially the chief charges which can be laid against the present system of teaching medicine, but I am not going to suggest for a moment that the system is thoroughly bad. While I am actively interested with others in improving the curriculum by such alterations as are possible, the last thing I want to do is to discourage you at the outset of your medical careers or to damp the enthusiasm with which you are preparing to overcome such obstacles as are placed in your path. After all, no curriculum can be perfect, perfectly adjusted to all needs and all times, and any curriculum is just as good or as bad as you and your teachers care to make it. Let me ask you never to forget that there is something to be gained from all these years of work in the school and hospital far more important than success in examinations, or a licence to practise, something which is very difficult to describe within the limits of a single word. Perhaps "scientific culture" most nearly indicates what I have in mind. Somebody—I don't know who—once defined culture as "what is left over after you have forgotten all you have definitely set out to learn." An admirable definition of the kind of culture you may look forward to possess when you have passed your final qualifying examination and have forgotten most of the facts you were at so much pains to remember. Such culture is within your reach if you make the best use of your opportunities and absorb from your teachers a measure of their own spirit of scientific doubt and inquiry.

After all the real object of any educational curriculum is to cultivate in the student's mind a capacity for independent criticism based on a solid foundation of common knowledge. The common knowledge, that of accepted facts and theories, can be adequately tested by examiners and examinations, but a well-developed critical faculty is only recorded when its possessor is brought up against the difficult problems of actual practice.

You may well ask me how this very desirable state of mind can be achieved, a question which I will attempt to answer to the best of my ability.

In the first place I shall refrain from urging you to throw all your energies into your work as I have a suspicion that the conscientiousness, characteristic of your sex, may lead you to an excessive expenditure of effort without all the success it deserves. I would rather suggest ways in which your routine work may be advantageously supplemented by other interests.

Referring the other day to a memoir of Dr. Anstie, the first dean of your medical school, I found these words in the description of his student days: "He was not indisposed to stray from the clearly-defined path of a particular study—to turn up, as it were, some byway of thought in company with a sympathetic friend, and discuss points of interest the bearing of which upon his work as a medical student was not quite evident." Dr. Anstie had a short but brilliant career as a physician and it may be that this habit of his as a student was a factor in his subsequent success. And a great teacher of mine, Hughlings Jackson, used to urge upon us the value of sitting down in a comfortable chair at the end of a day's work, allowing one's thoughts to wander around something which had roused one's interest and jotting down the ideas and suggestions to which it would give rise. It *was* a valuable habit; it encouraged independent criticism, it prevented observations from being left isolated, gave them associations, and stimulated one to turn up and explore those byways of thought which are always to be found by those whose minds are fond of rambling.

Let me approach my next suggestion in this way. My colleagues here will probably agree with me when I say that the most important difference between a good and indifferent clinician lies in the amount of attention paid to the story of a patient. While the indifferent clinician is content to concentrate on what he can find out by various tests and methods of examination, the good clinician will devote time and energy in extracting all available information concerning the patient's life-history in the belief that he will only thus be able to see his present condition in right perspective. In the same way it is difficult to become scientifically cultured, if I may again use that term, without at any rate a considerable acquaintance with the history of science and the history of medicine. It is not enough to know what science or medicine teaches at the present day; without some insight into the evolution of that teaching, some familiarity with the work and lives of those who have contributed to it, there is grave danger of being unable to assess changing theories and new fashions at their true worth. Such hours as you may spend in historical research will not only show a profit, but bring you pleasure and confidence.

May I make one more suggestion? Your time is already fully enough occupied, but keep an hour or two now and then for the cultivation of at least one hobby. And by "hobby" I don't mean a form of athletic recreation, but some pursuit which engages your interest and involves a certain amount of intellectual activity. It should be completely divorced from your professional studies and, if possible, should lead you into association with men and women whose vocations and outlooks are different from your own. Anything from stamp-collecting to archæology will answer the purpose, which is to preserve your mental elasticity and to provide you with a handy and welcome respite from the strain of your life's work.

## THE RETURN TO ÆSCULAPIUS

By W. Langdon Brown, F.R.C.P.
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE

A striking feature of twentieth century medicine has been a return to the cult of Æsculapius: cleanliness, fresh air, suggestion, dream analysis, and psychological explanation. These were the cardinal tenets of the cult, and it is a striking fact that all of them were lost by medicine until quite recent times. The bathroom was an almost unknown adjunct to a private house until about 1860; fresh air was anathema for the sick until about the beginning of the present century; psychotherapy, until the war, was looked upon as a crank and studiously avoided by the majority of the medical profession as savouring of quackery. To-day we have returned to the cult of Æsculapius and are his faithful disciples.

There was much in the temple ritual which may now seem like quackery, but I would prefer to call it psychotherapy adapted to the need of those times. To-day there is still a craving for magical cures; the common phrase "it worked like magic" expresses that deep if subconscious desire. After all, our reason is a much more recent acquisition than our emotions, and when health is shaken it is the most recently acquired, the highest levels of the central nervous system that most easily lose control, and the primitive man peeps out of the cave in which reason has shamefacedly tried to conceal him.

For me the significance of this modern return to Æsculapius is the recognition of the importance not only of the disease which the patient has, but of the patient which has the disease—his reactions as an individual, his environment, and his hereditary trends. The old adage "examine the whole of your patient" thus assumes a new meaning. It is by this combined attack on the physical and psychological side that medicine in the future will make advance and still further aid human suffering.

Looking back to my student days, it seems to me that even that interval of time has seen many organic diseases robbed of their worst manifestations. Yet we are only just beginning to tackle seriously those maladies of the mind which lead to so much suffering and which if they do not destroy the body may yet destroy the soul. I am not thinking merely of insanity, but of psychoneuroses, phobias, obsessions, and compulsions which can turn life into a hell both for the patient and his family. Valuable research is going on into the way in which both the rational and instinctive levels of the mind work, but for years to come our practical handling of these problems must remain largely empirical.

Even in physics the upholders of the quantum theory maintain that we cannot observe an object without altering it. Whether that be so or not, I am certain that we cannot even observe a patient without altering him for good or evil. We shall inevitably produce reactions by everything we do, say, or leave unsaid. How potent these reactions may be, physiology can teach us.

I will yield to no one in my admiration for the fruits that biochemistry has laid at the disposal of the physician. But this makes me all the more anxious not to see biochemical methods misused. Too frequently the patient is handed a long list of analyses, which neither he, his doctor, nor the analyst himself can really interpret. They convey an impression of scientific accuracy which is entirely illusory. Consider how profoundly the psychical state can modify the secretion of the digestive juices, how it may disturb the functions of the kidneys and bowels. Is it conceivable that it has no influence on these minute biochemical properties? The discovery of argon was described as the triumph of the third place of decimals, but that stage is not yet reached in clinical medicine, and it is sounder to recognise that fact. What is the use of noting that a particular drug raised blood pressure by 2 mm. when a political argument will easily raise it 20 mm. or more? I am, of course, not decrying exact analysis in research work, that would be absurd. But research implies correlation of a large number of results with appropriate controls, not the handing of an alarming set of figures to a nervous patient. The continental spas began it and we are tending to follow suit. I consider that it is chiefly done to impress the patient, and that it is not legitimate, since the impression is liable to be a harmful one.

It is not the function of the doctor to suggest ill-health. That I lay down as an axiom. If you follow it you will probably lose many patients who find it more interesting to be told they are ill, but you will do more good in the world. You may take it that every patient who consults you, whether he brazens it out or not, is in a state of fear. He is thereby rendered more suggestible, and your attitude, whether encouraging or the reverse, can profoundly affect his autonomic nervous system through his emotions, and thereby practically every chemical reaction throughout his body may be modified. Our attitude influences not only his own chemical mechanisms but will actually modify the effect of the drugs we give. Herein is the scientific explanation of the fact that the best of tonics is hope.

But an essential factor in hope is faith. The patient must be able to believe in you, in your knowledge, care, and skill. You will have to give good grounds for this faith, and in order to inspire it no aspect of the case must be neglected. Too often the success of unorthodox lines of treatment is contributed to by neglect on the part of the orthodox professions of some such aspect. Bone-setting and osteopathy owed their rise to our former neglect of manipulative surgery, homœopathy to overdrugging in the past and neglect of expectant treatment, which means standing by to help nature wherever we can, and Christian Science to the materialistic attitude of pre-war medicine. In my opinion, however, the invaders are responsible for errors of commission which far exceed our errors of omission. They crystallise treatment around some postulate, such as small vertebral displacements, pain as a "false claim" or like curing like. And we cannot accept these postulates. But one feature all these unorthodox methods have in common, they utilise suggestion.

Now, organic disease is not so common as we often suppose. The wards of a hospital give the student an erroneous impression on this point, since the cases are specially selected. I have asked various general practitioners what proportion of the patients they see are suffering from functional rather than organic disease; not one of them placed it at less than 40 per cent., while some put it as high as 75 per cent. That is to say, about half to three-quarters of these patients were, broadly speaking, finding difficulty in adapting themselves to their environment. Clearly the trouble might be due to the environment, but also it might be due to themselves. In the sphere of organic disease a valvular defect in the heart may be compensated for by cardiac hypertrophy or it may fail to compensate, with resulting cardiac dilatation. In the same way an organ inferiority may determine a

man's attitude to life. An error of refraction, which Turner was able to compensate for so successfully as to become a great colourist, may lead a psychoneurotic to simulate blindness. A disturbing emotion will cause palpitations and a sinking sensation in the stomach. The normal individual recognises this for what it is worth, the psychoneurotic concludes he has heart disease or a gastric ulcer. This enables him to fulfil his unconscious or subconscious desire to retreat from life and evade his duty as a member of the social organism.

I am not blaming him; his external environment may, indeed, be difficult to-day. It is not surprising that many people find it hard to adjust themselves to conditions which are changing so rapidly. Moreover, the old sense of security has gone. Indeed, it is not only material prosperity which is in danger, it is liberty of thought which is becoming endangered by a relapse to medieval mentality. I particularly appreciated H. G. Wells's recent comment on certain events. He said that to him "it seemed more than anything else a rebellion of the clumsy lout against civilisation." The remedy for such ills of the State and those of the individual is the same—increased self-knowledge.

The foundations of the psychoneuroses are already fairly clearly known; the plans on which they are formed are consistent and comparatively few, but the elaborations and resistances which are built up on these plans and foundations are often baffling. Yet with sympathy and encouragement they may often be elucidated and the sufferer greatly helped. Although it is true that difficult and complicated cases of this sort call for specialist treatment, it is equally true that the ordinary doctor who goes about with his eyes open for the psychological aspect of disease will soon find that he can greatly increase his usefulness. He will find the simpler methods of Adler not difficult to acquire and not so time-consuming in practice as some others.—An American psychologist once said to Adler: "You haven't been talking psychology at all, but only common sense." To which Adler replied: "Well, why don't you also talk common sense?"

Sir James Mackenzie neatly defined symptoms as the disturbance of normal reflexes. A normal reflex is certainly purposive, and should be painless. Through a chain of conditioned reflexes we associate ideas and achieve consciousness. This consciousness appreciates that a disturbance of the normal reflex is painful and being still purposive proceeds to investigate the cause of the pain. The dog licks his bite, the burnt child dreads the fire, but from such simple defensive reflexes as these are built up elaborate associations of ideas, until in the process of social evolution certain individuals become set apart to be epicritic on other people's protopathic sensations and to try to rectify these disturbed and, therefore, painful reflexes. There is thus no break in the chain between simple reflexes and the evolution of the medical profession. Behold us here assembled as the last link in a long chain of conditioned reflexes!

## THE WALL BETWEEN THE CLINIC AND THE LABORATORY

By Arthur J. Hall, F.R.C.P.

EMERITUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF SHEFFIELD

One great objection to the examination system is that the student tends to "prepare for examinations" rather than for his life's work. Subjects which are not on the schedule, and on which questions are not likely to be asked, are apt to be neglected As the special subjects increase in number and complexity, it becomes impossible to include all of them as compulsory subjects. Another objection is that examinations have helped to form a wall between the earlier laboratory and the later clinical studies.

About a century ago, when schools of anatomy were being founded all over the country, no such division existed. All the subjects of the student's curriculum grouped themselves naturally around the practice of medicine; all the teaching was given by men actively engaged in practice. The only subject of study at that time which could be called a laboratory subject was human anatomy, and this was taught entirely in relation to medical practice.

There was another factor in those days which helped in the coördination of studies. Every student entered upon his career by becoming an apprentice to a medical practitioner. Thus from his earliest student days he came in direct contact with sick persons. However few or elementary the studies of the apprentice may have been, they did centre around medical practice. They were all being taken at the same time, and when completed, there was one single examination in all of them. The apprentice's first examination was also his final! Happy days indeed!

As the laboratory subjects applicable to medicine increased in number and difficulty, they began to take up so much of the student's time that there was little or none left for his duties as an apprentice. And so more than 50 years ago the apprenticeship system was ended. Thenceforth the student of medicine must spend the whole of his time at a recognised medical school.

The range of subjects required had now grown so large that they could not all be studied satisfactorily at one time, nor could they all be taken at one examination. It was therefore necessary to separate the various subjects into such groups as could best be studied together. Those subjects which deal with general scientific principles or with normal structure and function were naturally grouped together to be taken first. At that time these were the only subjects in the medical curriculum in which laboratory work was required from the student; such a thing as a laboratory in connexion with pathology or any other clinical study did not then exist. In using the expression "laboratory subjects" therefore I refer only to chemistry, physics, biology, anatomy, and physiology. In laying down regulations for the new medical curriculum, our forefathers decided that the student must "get the laboratory subjects out of the way" before beginning the study of medicine proper.

This "getting them out of the way" was made still more thorough by the regulation that clinical hospital work cannot be begun until they are all completed and the examination in anatomy and physiology has been passed. Actually the "getting out of the way of the earlier subjects" has been so effective that the difficulty now is to reverse the process. A wall of considerable height has arisen between the clinic on the one hand and the laboratory on the other. They work in separate buildings which may be some distance apart; indeed, they may not be in the same county; the teachers in the one group of subjects may have little or no experience of the other group: their respective outlooks may be quite divergent. The medical student of to-day may spend the first two or three years of his student days without ever seeing a sick person or having any opportunity of realising the bearing of his present studies on what will be the work of his life.

I do not want you to think that I am in favour of a return to apprenticeships. A century ago it may have been the best arrangement then possible; 50 years later it had already become a hindrance to progress. Nor do I wish to suggest that the teaching of science subjects should revert to the clinician. That would be equally retrograde. Medicine owes an immense debt to those who have devoted their lives to science, and that debt is ever increasing. One cannot, however, be blind to the one redeeming feature of the old régime; it did impress on the student from the very first that it is the practice of medicine to which all his studies are to be applied.

To-day the medical curriculum has become separated as it were into a series of courts each walled off from the other. The gates between them are locked. No student is allowed to go through until he can satisfy the gatekeepers that he is fitted to do so. When he goes through the gate from the laboratory court to the clinical he finds that it is laid out differently to the one in which he has just spent two or three years. There are new manners and new methods. To his surprise some of the things deemed important in the one are considered unimportant in the other, and vice versa. It is all rather confusing and should be remedied.

It can be remedied. More easily perhaps in some places than others, but with a little effort everywhere. The wall must come down! Even if it is replaced by railings they will at least enable people in each of the courts to see what is going on in the other, and occasionally talk to one another through the grille. To a certain limited extent this has been done here and there. About ten years ago Prof. J. B. Leathes, at that time dean of the medical faculty, urged us to make an attempt of this kind in Sheffield. It is not necessary to weary you with full details of his scheme. Like all other changes it required a good deal of time and patience before it was completed. In principle it is simple. The student, instead of being discouraged from learning anything clinical until he has passed all his examinations in the earlier subjects, as he has been under the old system, is obliged under the "Leathes scheme" to begin attendance at hospital as soon as he has completed his first winter session of anatomy and physiology. At this point he must pass an examination in elementary physiology, the limits of which are defined. During the next years, whilst continuing his anatomy and physiology as before and preparing for the examination in them, he spends about one-sixth of his time at elementary clinical classes at the hospitals. These are given by members of the hospital staffs, and the material chosen for demonstration is such as will permit of more direct correlation with his laboratory studies. As the student becomes more fully occupied with his clinical studies during the following year, the course of physiology is so arranged that the teaching can be in great part directly applied to his hospital work, so that physiology merges imperceptibly into medicine.

At first the clinical meat was rather too much for the laboratory bread. With time and experience, however, these have now been adjusted, and both laboratory teachers and clinicians concerned have not the least doubt that this form of mental diet has proved of great value. It has widened the interest of the student in his laboratory work, and when he reaches the stage of full clinical work he brings with him more of the laboratory atmosphere. Incidentally also it has brought the two sets of teachers into more direct contact with each other.

It is said that at some schools there are difficulties in such a "sandwich" system which are insurmountable. One of these is the distance between the two institutions in which the two sets of studies are carried on. That was actually one of our difficulties. In Sheffield, as here in Birmingham, the clinical hospitals are some distance away from the medical school. With modern facilities of transport, however, the time taken up in going to and fro is almost negligible, especially now that a motor-cycle with carrier seat seems almost as indispensable a part of the student's equipment as was a microscope in days gone by. In those places, and there are many, in which the hospital is close alongside the school no such difficulty arises. In such it seems almost unthinkable that a future medical man should study there for two or even three of his five years without ever being taken for instruction into the casualty room, the wards, or even the dead-house.

It may be that equally good or even better schemes are in use elsewhere, or will be evolved eventually, which will bring the early and the later studies even more closely together. Meanwhile Leathes' scheme is an attempt to pull down the wall, and noteworthy in that it came from the laboratory side.

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## DIET, EXERCISE, AND WEIGHT

By E. C. Dodds, F.R.C.P.

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Without considering the complicated biochemical processes at work which enable the body to utilise its food, we can obtain an insight into the end-results of consuming a certain food in just the same way that an accountant examines the state of a business; he does not need to know anything about the technical side but by examining the balance sheets he is able to tell whether the company is going to go downhill, remain stationary, or improve. By a precisely similar method it is possible to prophesy whether the weight of the body will decrease, remain constant, or increase, and to reduce the weight of the body at will.

It was Lavoisier who first pointed out that the supply of energy required by the body for the performance of its functions was derived solely from a process of burning up of the food substances. In order to effect this combustion oxygen is breathed in from the air, and the products of combustion, carbon dioxide and water, are passed out during expiration through the lungs. The energy provided by this slow combustion is utilised in muscular contraction and maintenance of the normal body temperature. It is thus possible to measure the amount of food used up by the body by measuring the oxygen taken; the energy output of the body can be expressed in the amount of oxygen a person breathes. A starving person is still capable of considerable activity, which may be muscular, mental, or even in some cases political, but he will lose weight because, in the absence of food, he is burning up his own body with the oxygen he breathes (in other words he begins to eat himself).

It is obvious that the more work a person does the more oxygen will have to be taken in, and, therefore, the more food will have to be eaten if the weight is to remain constant. There are two extremes in energy requirements, one the greatest possible physical activity, and the other the minimum activity. The minimum activity of the body can be arrived at by observing a person who has rested and has taken no food for twelve hours and is lying quietly in bed. The only work performed by the body is the

contraction of the heart and the movements of the chest and other organs; the oxygen consumption in these conditions is referred to as the basal metabolic rate, which must be allowed for in any consideration of the energy requirements of the body. Corresponding to this rate one must obviously have a basal diet which will provide sufficient energy as food to allow for combustion without destruction of the body substances. This forms the basis of all dietetic calculations.

A small thin man will require much less energy than a large heavy one. A person 5 ft. 8 in. in height, weighing normally 10 st. 6 lb., should have a basal requirement for 24 hours of 1500 calories; that is to say, such a person in bed with no physical exertion and provided with food to the extent of 1500 calories would maintain a constant weight. The minute, however, that he sat up in bed he would lose weight on such a diet, and if he got out of bed and walked about, then still more calories would be required to maintain a constant weight. Thus by studying the oxygen consumption under varying conditions it is possible to find out exactly how much food is required for living an ordinary life.

The type of life led determines the number of calories required; the appetite is no guide. For a quiet, retired life with long nights and long periods of sitting at ease, some 2000 to 2300 calories will be needed, whilst for an ordinary sedentary life such as that of a clerk or university professor, about 2500 will be sufficient. The hardest occupations have been found by this oxygen consumption test to be that of a Canadian lumberman or, in this country, of a labourer in a brick yard. These workers expend a total of some 8000 calories in 24 hours, and have to eat four times as much as the sedentary worker in order to keep their weight from falling. Contrary to the general belief, the hardest mental work makes no difference to the oxygen consumption, and brain work makes no difference to the energy requirements of the body. This problem has received most careful attention.

The experiments were as follows: a clever worker was placed in an apparatus which enabled the oxygen consumption to be recorded. A series of observations were made: firstly, with the person sitting down and allowing his mind to wander, or in other words thinking of nothing; secondly, with him sitting in precisely the same position and attitude reading a magazine or novel; thirdly, under exactly the same conditions performing a series of elaborate calculations requiring most minute attention and great mathematical knowledge. The oxygen consumption remained unaffected, and therefore it can be confidently stated that no indulgence in food or drink can be allowed biochemically as a reward for severe mental activity.

It would appear at first sight that the problem is a very simple one, and that the consumption of extra food could be balanced by taking more and more exercise in order to keep a constant weight; but we all know people who eat much and yet remain thin, and others who, in their own words "eat nothing at all," and yet continue to increase in weight. There must be some internal regulating mechanism in the body which governs the weight automatically. It is very easy to reduce weight, but much more difficult to increase the weight of a thin person, particularly if it has remained constant for years.

Considering the actual food, assuming that we have some 2500 calories at our disposal for 24 hours, we must consider the type of food very carefully, since there are other problems involved besides mere energy production. For a man of sedentary occupation about 100 g. of protein are necessary during the 24 hours. Each gramme of protein will provide four calories, and therefore some 400 calories must be allotted to protein. The rest can be divided between carbohydrate and fat, more or less how we like, remembering that 1 g. of carbohydrate provides four calories and 1 g. of fat nine calories. Tables of food values are easily obtainable, but misplaced faith in the nourishing qualities of various foodstuffs is still prevalent. For example, the anxious mother in making beef-tea gives a watery fluid to the invalid, and the solid matter—which contains 99 per cent. of the nourishment—to the dog. To the lay mind, again, there is perhaps no more potent restorative than oysters. Now a dozen oysters will yield 88 calories of energy—i.e., the well-to-do person is spending say 7*s.* to purchase 88 calories worth of food. The slice of brown bread and butter which he eats with the oysters will give him well over 100 calories. The most nourishing of all foods is butter, which contains some 3600 calories to the pound. It is an almost universal fact that the really nourishing foods are cheap, whilst the low caloried foods are expensive. The example of the oyster can be repeated many times; a lobster, for instance, when eaten alone will yield only some 90 calories.

It would be possible to quote innumerable examples of widespread beliefs which are quite unfounded. Bread is often refused because it is fattening, in favour of toast. Weight for weight, however, toast is more nourishing than bread, since it has lost its water and therefore contains more protein, fat, and carbohydrate to the gramme. The conviction that a particular soup must be really good and nourishing because it sets to a jelly when cold has little basis, since gelatin is one of the few proteins which will not support life. It is a pity to see anyone at a dinner refusing, let us say, oysters and clear soup, which is of very low calorie value and could be taken with impunity, while taking in literally hundreds of calories by eating rolls and butter. No wonder these people complain bitterly that they are very careful with their diet and yet maintain or increase their weight. From these examples it can be seen that any form of dieting adopted without reference to an accurate set of food tables will almost certainly bring unnecessary privation, associated with disappointing results. If a person of the dimensions referred to above as requiring the 2800 calorie diet starved himself completely, it would be possible to work out how much he would lose. Let us assume that he would lose nothing but fat, that is, 2800 calories worth of this substance a day, which in terms of butter would be little under a pound. Since human fat contains a considerable percentage of water, the amount lost would be well under the pound. By this means we can see that with complete starvation, attended by the performance of ordinary duties, not more than 5 lb. would be lost in a week. Let us assume that the person did not starve completely but took 1000 calories per day, which would mean a very strict diet; then it would only be possible for him to lose 3 lb. or so a week. The question of weight reduction is a purely scientific and mathematical one, in which superstition, blind faith, and various articles of food referred to as "slimming" have no legitimate place. To modify an axiom of the working man, one may say that no food is slimming but that some are more fattening than others. A diet may be evolved of low caloried food which will produce a loss in weight, but the principles outlined must be strictly adhered to.

It is much easier to take in calories in the form of food than to get rid of them by exercise. As a means of dissipating energy, turkish baths, warm and

tepid baths, and the like have no effect, whilst massage only reduces the weight of the masseur. Cold baths, on the other hand, greatly increase the metabolism, and therefore balance articles of food. A cold bath of five minutes' duration at 16° C. causes the loss of about 70 calories. I have already pointed out that exercise increases the requirements above the basal rate, and therefore food is utilised which, if it is not provided, will be derived from the actual body substance. Most people have an erroneous view about the weight-reducing character of exercise, and it cannot be recommended for this purpose unless combined with very rigid dieting. A few examples will illustrate this.

The maximum energy output for short periods ascertained by exercising trained athletes on specially constructed apparatus and estimating at the same time their oxygen consumption is in the region of 600 calories per hour. Of ordinary games, perhaps squash racquets requires the greatest output of energy. A person playing for roughly half an hour will have utilised some 300 calories, equivalent in terms of food to, say, two slices of bread and butter or, alternatively, to two dry Martini cocktails.

We can illustrate this in another manner: let us assume that a person on a diet wishes to drink beer, but is determined to work off all the additional energy by exercise so as not to put on weight. For every pint of beer he drinks he will have to play squash racquets for half an hour or to exert himself for a longer period at a lower rate of energy expenditure, such as walking fives miles at four miles an hour. Anything like a convivial evening would imply many days spent in playing squash racquets. A glass of champagne is equivalent to about ten minutes squash, whilst a double whisky and soda would require the full half hour. A large whisky corresponds in food value to three boiled eggs, yet very few who had dined out would take six boiled eggs as a night-cap. Those who assemble at public dinners have usually already consumed their essential 2800 calories at breakfast, luncheon, and tea, and therefore the dinner is not necessary from an energy standpoint. I have estimated that the total number of calories to be offered to each host or guest at the Middlesex Hospital annual old students' dinner is 2500. Let us assume that there will be perhaps a few who will drink beverages other than water, and if we put this down at a very modest consumption we can add another 725 calories. In order to overcome the effects of this it will be necessary to play squash for five and a half hours or, alternatively, to climb a mountain of the height of Ben Nevis five times, to walk 60 miles, or to run 30 miles. As another alternative 50 hours submersion in a cold bath would be effective.

For those who feel anxious I may point out that diners may be divided into two classes: those more fortunate ones who are able to deal with this sudden glut of food and drink without exercise, and those less fortunate who definitely will put on a certain amount of weight. Even for this class there is a definite mechanism for dealing with the excess, only it does not work so well as in the naturally thin person.

In conclusion it may be emphasised that any form of obesity can be reduced by suitable application of the principles outlined, and if a person states that he increases in weight although he eats practically nothing, he is deluding himself or his advisers. It is just as impossible for a person not to lose weight when fed on a deficient diet as it is for a car to run without petrol. The average man would not consider for a moment the statement that a car would run without petrol, yet he believes without question the obese person who tells him he eats practically nothing at all and yet puts on weight. If this were so, then the laws of thermo-dynamics would be wrong.

I may add none of the statements made in this very brief account of dietetics are revolutionary or original. Every statement that I have made has been known to physiologists and biochemists for the last 20 years, which indicates the vast store of knowledge that has already been accumulated in the physiological and biochemical laboratories, and up to the present has been made very little use of by the outside world. The continuation of the war was only made possible by the absolute powers of dictation with regard to dietetics given to the German physiologist, Rubner. In the early days of the war he was entrusted with forming a committee of physiologists, who worked out the most economical way of providing the necessary number of calories for the German people. By the application of the principles described they were able to make the very most of their strictly limited food-supplies, with the result that despite the blockade the German people were maintained in a tolerable state of health until near the end of the war. If they had made mistakes of the beef-tea variety, starvation would have resulted before 1916.

If these principles are so important during war, they must be equally important during peace, and one can only conclude with an appeal to all to apply scientific principles to the processes of life, and particularly to call upon the vast store of knowledge with regard to food and dietetics.

## INFECTIOUS DISEASE

### IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 23RD, 1933

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 4 (last week 5); scarlet fever, 3117; diphtheria, 1169; enteric fever, 101; acute pneumonia (primary or influenzal), 586; puerperal fever, 54; puerperal pyrexia, 117; cerebro-spinal fever, 22; acute poliomyelitis, 32; acute polio-encephalitis, 5; encephalitis lethargica, 11; relapsing fever (Bridgnorth R.D., Salop), 1; continued fever (Paddington), 1; dysentery, 33; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 26th–27th was as follows: Small-pox, 11 (last week 10); scarlet fever, 2090; diphtheria, 1590; enteric fever, 19; measles, 373; whooping-cough, 241; puerperal fever, 28 (plus 14 babies); encephalitis lethargica, 254; poliomyelitis, 5; "other diseases," 153. At St. Margaret's Hospital there were 19 babies (plus 12 mothers) with ophthalmia neonatorum.

*Deaths.*—In 118 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 6 (1) from measles, 2 (0) from scarlet fever, 19 (4) from whooping-cough, 30 (3) from diphtheria, 115 (26) from diarrhœa and enteritis under two years, and 20 (2) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa outside London 15 were reported from Liverpool, 8 each from Leeds and Birmingham, 5 each from Hull and Sunderland, 4 from Newcastle-on-Tyne, 3 each from West Ham and South Shields. Leeds and Liverpool each reported 3 fatal cases of diphtheria; Huddersfield, Hull, Manchester, and Plymouth each 2.

The number of stillbirths notified during the week was 241 (corresponding to a rate of 40 per 1000 total births), including 33 in London.

MANOR HOUSE HOSPITAL.—This hospital at Golders Green is about to be enlarged by the addition of a new wing at a cost of £25,000, which is to be named after the late Mr. Bernhard Baron, who bequeathed £10,000 to the institution. The wing will include a theatre, an X ray department, and additional domestic accommodation.

# POST-GRADUATE LECTURES

SEVERAL of the London teaching hospitals have been holding short post-graduate courses during the past fortnight. As in previous years, we propose to publish abstracts of some of the lectures delivered. Of the three which are summarised below, Dr. Miller's was given at St. Mary's, Mr. Lake's at Charing Cross, and Dr. Abrahams' at Westminster Hospital.

## PANDEMIC ACIDOSIS IN CHILDREN

(DR. REGINALD MILLER)

THIS subject has been suggested to me by a note received last autumn from the head of a preparatory boarding school, which ran: "All my children have returned to school this term suffering from acidosis: what is this new disease?" This label is now being attached to so many children, that it is, I hope, excusable for the purpose of this lecture to speak of the "pandemic type" of acidosis. As I understand it, its discovery derives from the study of cases of cyclical vomiting between the attacks, so that it describes the persistent condition predisposing to cyclical vomiting. I shall therefore deal first with the acute attacks, secondly with the "pandemic" type, and then try to reach some conclusions in the matter.

*Acute attacks.*—At one time cyclical vomiting was held to be the expression of a ketosis of obscure origin, but there have always been difficulties in the way of accepting this explanation. The attacks are not very similar to known conditions of ketosis, as in diabetes; the occurrence of ketosis and of vomiting can seldom be shown to follow each other in the relationship of cause and effect; ketosis is common in children who show no symptoms, and can be induced even in cyclical vomiting children without any harm resulting; and the term cyclical vomiting is now applied to cases which show no vomiting at all, but attacks of diarrhœa or pyrexia. On these grounds it seems clear that the ketosis of an attack of cyclical vomiting is the result and not the cause of the symptoms. The cause of the attacks appears to be, in the so-called cryptogenetic cases, an intense poisoning of the liver and this sets up the vomiting. There is proof of the disturbed liver function in many of the symptoms of the attack, notably in the frequent occurrence of pale stools; and the extreme fatty changes in the liver found post mortem, comparable to those found in post-anæsthetic vomiting, point strongly in the same direction.

"*Pandemic type.*"—A. A. Osman holds that cyclical vomiting occurs in at least 30 per cent. of hospital children, in whom it had been thought to be much less common than in children of the well-to-do classes. He states that he was giving these children extract of malt as a placebo and noted the good effects of it on the general health and the reduction in the frequency of acute attacks. On investigating their biochemistry with H. G. Close he was unable to find any evidence of ketosis, but he claimed to find a slight lowering of the plasma bicarbonate, an acidosis not due to ketosis. The association between this form of acidosis and cyclical vomiting is not clear.

As regards the cause of the vomiting and other upsets that constitute cyclical vomiting nowadays, there seems no doubt that the original factor is, in the so-called cryptogenetic cases, a toxic knockout of the liver. This toxæmia comes from the intestine and is in milder degree the cause of the fatigue and ill-health in between attacks. Although I agree that ketosis is not notably present in the interim stages, in my experience indicanuria and the other signs of intestinal toxæmia are prominent throughout. In addition I think that there is a diminished glycogen reserve in the liver without hypoglycæmia (Cameron's "glycopenia"), and the administration of glucose by improving this lessens the vulnerability of the liver to poisons. In many instances glucose does little good, and direct treatment of the intestine is required. The withdrawal of normal amounts of fat from the diet is unnecessary and may be harmful.

## THE VALUE OF PRE-OPERATIVE INVESTIGATION

(MR. NORMAN LAKE)

AN outstanding feature of surgical practice to-day is the attention paid to pre-operative investigations, and this devoted not entirely to the attainment of greater precision in diagnosis but also to estimations of the patient's ability to "stand" the operation, and in certain instances to test the prognosis of an operation if performed. There are many who maintain that the older methods are capable of giving results just as accurate and useful. I myself believe that there are fewer gross mistakes in diagnosis nowadays and certainly fewer cases submitted to unjustifiable or futile operations. It is true that this improvement may be due to other factors than pre-operative investigation but I am inclined to think that, taken as a whole, such investigations are of extreme value, though individual tests are by no means of equal certainty; for some an approximation to 100 per cent. accuracy can be claimed but others fall far short of this, and may even have a negative value when they prove sufficiently misleading to upset an accurate clinical diagnosis.

There is, perhaps, no branch of surgery in which pre-operative investigation has been more intensively applied and reached a greater state of precision than in genito-urinary work. The ability to test the functional capacity of the kidneys by estimations of blood and urine have reduced the mortality of prostatectomy and other operations in a way that no mere technical innovation could have done. The use of the cystoscope and the introduction of ascending and descending pyelography have placed the diagnosis of urinary lesions upon a basis of precision which is unknown in many other branches. The more recent introduction of lipiodol injection of the vas may do the same for many obscure lesions of the genital system.

In the gynæcological sphere tests for patency of the tubes have greatly enhanced our ability to deal with sterility in the female. The injection of radiographically opaque materials into the lung, while not usually a pre-operative investigation, is occasionally of great value in localisation of surgical lesions. The same may be said of the intrathecal injection of lipiodol, for, despite the fact that many neurologists consider this redundant in view of the accuracy of clinical diagnosis, I have more than once known it correct an error of clinical localisation of considerable extent. Ventriculography too may sometimes prove of value to the surgeon, especially in the localisation of the obstruction in hydro-

cephalus. It is impossible in a short review to discuss each method in turn, but a few of the commoner and more important methods may be considered in detail.

The technique of investigation of the *alimentary canal* by barium meal and enema is now firmly established, though there is still room for improvement in the interpretation of results. In gastric ulceration the method is fairly accurate but even here much depends upon the phase of the ulceration; luckily it is usually in the active phase that the investigation is carried out. Nor must the method be expected to reveal all ulcers, even the newer technique of "whitewashing" the stomach may fail to reveal smaller and more recent lesions. In duodenal ulcer the results are far less satisfactory. Here the crater is only occasionally displayed and the diagnosis has to be made by deduction from secondary signs. Deformities of the duodenal cap can be produced by other intra- and sometimes extra-abdominal causes, while a structure so intimately under the control of the autonomic system cannot but reveal passing changes in the radiogram which may be very misleading. Pre-ulcerative conditions and duodenitis give a picture very similar to that of true ulceration and so the test frequently fails to give the surgeon the information he most requires to decide whether medical or operative treatment is indicated. In lesions of the appendix I hold this method of investigation to be of little practical value, despite many statements to the contrary, which are based on a vicious circle of arguments. Many appendices show slight variations from the normal which with the backing of an X ray diagnosis may be interpreted as pathological; when such cases are later used as evidence of the accuracy of X ray diagnosis the circle is completed. Even tenderness over a radiographically displayed appendix is no sure indication that it is pathological, as the operating table constantly reveals.

The barium enema has proved its worth, but is likewise not infallible. In the early stages of colonic carcinoma it may prove very misleading, while in the later stages for the most part it merely confirms, or sometimes usefully locates, the lesion. In diverticulosis, on the other hand, its value is paramount, for it is impossible to make a certain diagnosis of this relatively common condition without its aid. Colonic spasm, with or without colitis, may be displayed if the phase of the disease is an appropriate one, but in the intervals mistakes are frequent. Hirschsprung's disease, usually obvious clinically, is easily confirmed and the extent and localisation of the lesion are determined in a way otherwise impossible. Other methods of investigation commonly applied to the alimentary canal are the fractional test-meal and the test for occult blood in the fæces. The former I have found to be of but small diagnostic value in cases of ulcer except as supporting evidence; in the distinction between ulcer and carcinoma it may prove of supreme value if the many pitfalls receive due consideration. I continue to have the test carried out as a routine guide to the type of operation best suited to the case. On the whole I believe that in the presence of a high acid curve a partial gastrectomy is indicated rather than a gastro-enterostomy, since only in this way can any profound alteration in the acid level be obtained. The effect of the injection of histamine and other excitors of the parasympathetic system upon the test-meal curve may also prove a pre-operative guide when we are better acquainted with the effects of ablation of the autonomic nerves upon the secretions and motility of the stomach; but that is for the future. The test for occult blood if properly controlled is a very accurate one, so sensitive indeed that considerable care is needed in its interpretation. It is obviously however an indication of the presence of disease rather than of its nature and in this respect may oft-times be tantalising and misleading.

The practical results of *cholecystography*, in my experience, have not given much help. Perhaps the test is too accurate for our purpose, the surgeon being more concerned to know if the patient's pain is due to some gross pathological condition in the gall-bladder than if the functional capacity of the organ to concentrate dye is below par. It must not be overlooked that in carrying out this test four separate factors are involved: (1) the ability of the intestine to absorb the dye, a function that may be seriously upset in many abdominal lesions with which gall-bladder disease may be mistaken; (2) the ability of the liver to secrete the dye, a point of some historic interest since it was for this purpose that the halogen compounds of phenolphthalein were first used; (3) the ability of the dye to reach the gall-bladder; and (4) the ability of the walls of this structure to concentrate it. The test is concerned primarily with the last two factors and failure to take the others into consideration may well account for many of the apparent inaccuracies. The first factor can be judged to some extent by observation of the amount of dye showing in the colon, or may be circumvented by the more irksome method of intravenous injection, but in addition to the fallacies inherent in the method there are those of observation and interpretation. Despite these difficulties however the test is frequently of value and where a filling defect due to a calculus is present it is really diagnostic. But it must be remembered that an excellent radiographic shadow may be associated with a grossly diseased gall-bladder, and conversely, so that evidently the correlation between surgical disease and ability to concentrate dye is not an exact one.

I have found the *diastase test* for pancreatic disease to be extremely valuable in the diagnosis of acute lesions of that organ. I would not diagnose acute pancreatitis if the index were not considerably raised, nor would I hesitate to make the diagnosis if it were. In eight cases where clinical differentiation proved impossible the test showed accurately that three were positive and five negative.

The prognostic tests which are frequently performed when operation upon the *sympathetic system* is proposed are mainly: (1) the fever test, in which vaso-dilatation is produced by the induction of an artificial fever; (2) blocking of primary nerve trunks by para-vertebral injection of local anæsthetics; and (3) spinal anæsthesia. In the last two methods the vaso-constrictor fibres are temporarily blocked and the accompanying rise of surface temperature noted. My own experience has led me to doubt whether these tests can invariably be regarded as reliable guides. Any temporary functional change brought about by these methods when rendered permanent by operative interference may, in the course of time, be followed by corresponding organic changes, the temporary result being thus improved upon.

I can best illustrate this point by reference to a series of barium enema radiograms following sympathectomy for Hirschsprung's disease. A few weeks after division of the appropriate nerves the bowel is seen to be much smaller and more active, but if the observations be continued over a period of one or two years it will be found that the improvement is progressive so that the later result may be called a

veritable cure when the earlier condition was merely a great improvement. It will be clear that the subsequent organic changes in the bowel wall could not possibly be estimated or deducted from any observance of the immediate and temporary effect produced by spinal anæsthesia. I have seen a similar sequence in cases of presenile gangrene where the rise of surface temperature following spinal injection has actually appeared insufficient to justify operation and yet, after a sympathectomy, the ultimate result has been very satisfactory. It must not be assumed however that such delayed results are to be seen in all sympathectomies; there are indeed some diseases, notably Raynaud's, in which a compensatory mechanism appears partially to reverse the effect in the course of time and so upsets the pre-operative prognostication in the opposite direction. The results of these tests must therefore not be accepted without critical consideration. Repetition of pre-operative investigations may enhance their value; for example, the repeated finding of occult blood in the fæces will thus often lead to an accurate diagnosis when its solitary demonstration might leave one hesitant.

The acumen of the clinician is as needful to-day as it ever was, but if the evaluation and interpretation of various tests now occupy more of his attention and the purely clinical examination less, I believe that in the long run our patients are not the losers.

## INDIGESTION

(DR. ADOLPHE ABRAHAMS)

INDIGESTION is not an easy subject to define since all sensations which obtrude themselves into consciousness and are apparently related to the alimentary canal are necessarily included in a clinical or symptomatic definition, although they may have no causal relation to the viscera either structurally or functionally. Per contra, true indigestion may be present when no complaint is referred to the digestive tract; for example, the insomnia which results from intestinal dyspepsia. Furthermore, grave and even mortal disease of the abdominal viscera may be present without even the most trivial alimentary symptoms. It is best to accept these difficulties and admit inconsistencies; for any value which may be attached to a discussion on indigestion will depend upon a practical use of the term which must include the complaint of loss or disturbance of appetite; of vomiting, abdominal pain, or flatulence; and of discomfort or of vaguely unpleasant sensation in the abdomen. Not one of these symptoms, not even acute abdominal pain, will aid a distinction of organic from functional disease of the alimentary canal.

Ryle's classification of the dyspepsias is convenient and comprehensive: (1) mechanical; (2) irritative; (3) nervous or psychogenic; (4) toxic or infective; and (5) habit.

The *mechanical* causes for dyspepsia are quickly dismissed. They include deformities of the stomach resulting from ulceration, whether benign or malignant, and occasionally other extragastric structural causes for interference with gastric motility.

The *irritative* group comprises what is generally accepted as reflex dyspepsia, the disturbances (chiefly of motility) resulting from extragastric disease such as chronic appendicitis, chronic cholecystitis, and pelvic disease. An overloaded colon can act as a source of irritation and a wider acceptance brings into the group an almost unlimited number of debatable causes such as eyestrain. It must be pointed out that gastric and duodenal ulcer produce pain by precisely the same mechanism acting as a source of irritation, though the source is within the stomach and not more or less remote.

The *toxic* group includes oral infection, excess of alcohol and tobacco, and grossly improper food. The dyspepsia of phthisis might come into this category. Ryle includes intestinal auto-intoxication, but in my opinion it is better to indict constipation upon a mechanical basis. Other nebulous toxic causes for dyspepsia will be found in nephritis and pregnancy.

*Habit* dyspepsia—the dyspepsia resulting from overwork, insufficient exercise, lack of interest in or absence of occupation. This group is only artificially separable from the nervous group inasmuch as the diet proper to an individual in good spirits and with opportunity for recreation and rest may induce dyspepsia in circumstances of worry, fatigue, exhaustion, or depression.

In the *nervous* group we should place gross disorders of the appetite such as bulimia, pica, or anorexia nervosa, air-swallowing, eructations. The gastric crises of tabes naturally occur in this connexion, although Ryle places them in the irritative group. Disturbances of the sympathetic nervous system remind one of the alimentary symptoms in Addison's disease apart from the disequilibrium which leads to so much functional disorder.

Of the *symptoms* calling for special consideration, abdominal pain has many extra-alimentary causes as well as those of abdominal visceral origin and much care and patience must be expended over the anamnesis. Frequently, for example, the pain which points to a grave disease of the heart is labelled indigestion when a careful interrogation would show that exertion, possibly of a comparatively slight degree, was really responsible.

Genuine chronic abdominal pain is rarely continuous; when it occurs malignant disease or ulcer which has penetrated and become adherent must be thought of. Peptic ulcer may be present without the production of any symptoms and advertise its existence for the first time by perforation or hæmorrhage. But ulcer is usually suspected on the history of pain occurring at fairly regular periods after meals, related to the nature and quantity of the food, relieved by vomiting—if vomiting occurs—and by alkalis with remissions of complete well-being which tend to become shorter and less frequent as cicatrisation progresses. As has been suggested, the mechanism by which pain is produced is in no way peculiar to ulcer, and extragastric lesions such as a chronically inflamed appendix or gall-bladder or visceroptosis may present a close simulation which only radiography will decide. Many physicians refuse to admit the possibility of gastralgia in the absence of an organic lesion; yet it seems that in some cases one must assume a hypothetical hyperæsthesia of the gastric mucosa which may be related to certain foods and even to the interpretation of normal physiological occurrences in terms of painful sensations by appropriate lowering of the threshold of consciousness. As regards other, less definable symptoms, the effect upon the sympathetic nervous system of the higher centres enables us to understand how any depressing influence, grief, worry, anxiety, and fatigue, for example, leads to chronic dyspepsia in a predisposed subject. The disturbance is of the nervous system, not of the alimentary canal.

With this impression of the ætiology of dyspepsia in the absence of an organic lesion, it is essential that we should apply ourselves to the details of a sufferer's life. We realise that in some instances a complete

revolution in the patient's living and circumstances, something quite outside our therapeutic armamentarium, may be necessary to distract his attention from his viscera. Some faulty habits of hygiene we may correct, especially irregularity and carelessness of meals and of eating. Perhaps we insist unduly upon exercise, but its absence generally means a badly ordered life with insufficient recreation, so that our solicitude benefits indirectly.

In respect to diet we are often too fussy and ceremonial. This is really the fault of our patients in their insistence upon the provision of a "diet sheet." This request it is easy to understand. A patient not unnaturally resents mass production therapy; he likes to regard himself as an individual problem and expects a dietary which has been elaborated for his particular requirements. Moreover, he succeeds in this way in transferring the responsibility for his recovery to his doctor and exonerates himself from personal effort. Yet diet should play a very small part in the therapy of "nervous indigestion." Idiosyncrasies must of course be respected, but these it is impossible for us to deduce or guess. Apart from these a dyspeptic should be encouraged to accept as a principle that what has once agreed with him may in future be permitted notwithstanding his impression of its unsuitability on subsequent occasions. The alternative of excluding everything which has disagreed will eventually lead to the elimination of everything edible and even cold water. Dyspepsia from relative starvation is probably more frequently encountered than dyspepsia from over-eating unless chronic gastritis is present. The really serious disturbances of the nervous system responsible for gastro-intestinal symptoms bring the patient within the province of the psychotherapist or even the alienist.

# SPECIAL ARTICLES

## THE NECESSITY FOR A SAFE MILK-SUPPLY*

By G. S. Wilson, M.D., F.R.C.P., D.P.H.

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Milk is a valuable food, and so far as its nutritive properties are concerned it is not an expensive food. Its importance in infant feeding, its power to stimulate the growth of under-nourished school-children, its easy assimilability by the sick and convalescent, and its provision of a wholesome source of energy to the normal population, amply justify for it a very special place in the human dietary. It is therefore all the more surprising to consider that, while rigid control is exercised over the purity of water-supplies, of meat, and of certain other foods, there are no public health regulations that ensure in practice the cleanliness and safety of our milk-supplies.

### Cleanliness and Safety

Before proceeding further, it is important to define our terms. It is often assumed that "cleanliness" and "safety" are synonymous. This is a mistake. By "cleanliness" I understand the freedom of milk from extraneous matter, from pus, from blood, and from an undue number of micro-organisms, especially those of the putrefactive type—using this term in its broadest sense. By "safety" I mean the freedom of milk from pathogenic or potentially pathogenic micro-organisms and its consequent liability to give rise to infective disease in human beings consuming it. Many unclean milks, though æsthetically undesirable, are perfectly safe to drink, while very clean milks may, as the literature of milk epidemics shows, be highly dangerous.

It is perhaps desirable to elaborate this point in order to render it clear. The commonest pathogenic organisms that have been found in milk are: the tubercle bacillus responsible for tuberculosis; the bacillus of contagious abortion responsible for undulant fever; the typhoid, paratyphoid, food-poisoning, and dysentery bacilli responsible for enteric fever, acute gastro-enteritis, and dysentery; hæmolytic streptococci, responsible for scarlet fever and septic sore-throat; and the diphtheria bacillus, responsible for diphtheria. Of these, the first two gain access to the milk from the cow's udder, while the remainder are usually introduced by human beings who are either carriers of these organisms or are suffering from an actual attack of the disease caused by them. With the exception of the tubercle bacillus, milk that is produced under the most cleanly conditions from tuberculin-tested herds is almost as subject to contamination with the remaining organisms as is milk that has been produced without any special regard to sanitary precautions. The reason for this is that contamination with pathogenic bacteria of human origin takes place quite unconsciously, a few organisms finding their way into the milk from the fingers or throat of the milker or other person handling the milk. Once the organisms have been introduced, even in very small numbers, multiplication is liable to occur, since milk, clean or unclean, is an excellent nutrient medium for the growth of bacteria. To avoid contamination from human sources medical inspection of the personnel, combined with bacteriological examination of the secretions and excreta, is sometimes recommended, and is in fact practised in many parts of the United States of America; but while occasional long-standing carriers of pathogenic micro-organisms may be detected by this method, it is quite incapable, short of daily examination of every member of the milk personnel, of bringing to light the early clinical cases, the subclinical infections, and most of the purely latent infections in healthy carriers, which constitute so grave a menace to the safety of the milk-supply.

### Milk-borne Disease

At present a great deal of the raw milk sold in this country is neither clean nor safe. Much of it, besides having a high bacterial count, contains manure, pus, and even blood, the latter two coming from animals with diseased udders. Such a condition excites no protest, because these substances are conveniently obscured by the suspended fat globules in the milk. One wonders how many people would accept bread or sugar that was soiled with such products!

The frequency of tuberculous infection of the milk-supply has recently been the subject of a special inquiry, and the figures show that a proportion of raw market milk samples, varying in different parts of the country from 2 to 13 per cent., with an average figure of 6·7 per cent., contains living virulent tubercle bacilli (Report, 1932).

The presence of *Brucella abortus*, an organism

* Being the substance of a paper read before the Agricultural Section of the British Association at Leicester on Sept. 12th, 1933.

responsible for contagious abortion in cattle and for undulant fever in man, is widespread in raw milk. Since my original observations made with Miss Nutt at Manchester (Wilson and Nutt, 1926), Beattie has reported 34·9 per cent. of positive samples among mixed milks in Edinburgh, J. Smith 28·3 per cent. in Aberdeen, Morgan 37 per cent. in Cardiff, Priestley 22·3 per cent. in Burnley, and Rowlands 17 per cent. in Bangor. That is to say, at least 20–30 per cent. of raw market milk samples contain this organism.

Mastitis in cows is extremely common in this country, and hæmolytic streptococci are frequently present in milk. Since the part played by these organisms, when of bovine origin, in the causation of scarlet fever and septic sore-throat is still under discussion I shall not quote exact figures of their incidence.

Turning now to the practical outcome of these observations, let me give a few figures to indicate the extent of the danger to the public health caused by infected milk (see Table).

*Outbreaks of Milk-borne Disease in Great Britain 1912–1931*

| Disease. | No. of outbreaks. | No. of outbreaks in which number of persons affected is stated. | No. of persons affected in these outbreaks. |
|---|---|---|---|
| Scarlet fever and septic sore-throat | 31 | 25 | 3087 |
| Diphtheria | 13 | 12 | 732 |
| Typhoid fever, paratyphoid fever, and dysentery | 25 | 22 | 1843 |
| Gastro-enteritis | 12 | 10 | 3759 |
| Total | 81 | 69 | 9421 |

*Note.*—For previous outbreaks see Savage (1912).

These outbreaks are merely those of which I have been able to collect records, and probably represent but a fraction of the total number that have occurred. Many outbreaks are either not reported at all or appear only in the annual reports of the local medical officer of health. If the reports of every medical officer of health in the country were systematically examined for the last 20 years there is little doubt that the list of outbreaks of milk-borne disease could be considerably amplified.

It is further necessary to remember that the list given above refers only to epidemic disease. Many cases of sporadic infection by milk undoubtedly occur, but their source of origin is never traced or often even suspected.

The main disease that occurs sporadically is tuberculosis. From the incidence of cases of tuberculosis notified to the Registrar-General it may be calculated that approximately 4500 cases have occurred annually since 1912, due to the bovine type of bacillus (see Report, 1932). The total number of cases of bovine infection during the last 20 years may therefore be estimated at about 100,000.

Undulant fever is likewise borne by milk, and it appears probable that there are about 500 cases a year occurring in England and Wales. This figure has been arrived at by three separate calculations, all of which agree closely (Wilson, 1932). I may perhaps be excused if I give but one of them. Of 399 Widal sera examined by a number of different workers in Great Britain during 1928 to 1932, and about which adequate records are available, 21 per cent. agglutinated typhoid or paratyphoid bacilli in a significant titre, while 3·5 per cent. agglutinated *Br. abortus* to a titre of 1/80 or over, which in a patient with pyrexia has generally been found to be diagnostic of active infection. The proportion of these sera having agglutinins to the enteric group was therefore six times that having agglutinins to the brucella group. The Registrar-General's statistics for 1930 show that 2899 cases of enteric fever were notified in England and Wales. If we take a sixth of this number we may conclude that approximately 480 cases of undulant fever occurred in the same year. Since it is not known how long undulant fever has been prevalent in this country, the disease having only recently been recognised, no figures of its total incidence can be given.

Summing up, it may be said that during the 20-year period 1912–1931 there have been at least 81 outbreaks of milk-borne disease, affecting about 10,000 persons. During the same time about 100,000 persons have contracted tuberculosis of bovine origin through the consumption of milk, and an indefinite number have suffered from undulant fever, due to infection with *Br. abortus*.

These figures, I must again remind you, afford but a conservative estimate of the total amount of milk-borne disease. They refer merely to primary infections and do not include the secondary cases, which are often so numerous in outbreaks of septic sore-throat, scarlet fever, and diphtheria. Incomplete as they are, they are nevertheless formidable and demand attention from all who are genuinely anxious to improve the milk-supply.

Unsafe milk is a menace to the community, and—if only the farmers would realise it—a menace to agriculture. The danger of polluted water was early recognised, and during the last fifty years such active measures have been taken to protect against it, that water-borne disease has now been almost banished from the large towns of this country. The danger of polluted milk still remains unrecognised by a large proportion of the population, and it is open to any farmer to distribute milk heavily infected with tubercle or other pathogenic bacteria, and be paid for doing so.

The criticism is sometimes heard from those who do recognise the present position that more harm than good will accrue by informing the public of the danger of infected milk. By laying stress on the danger of milk one will merely deter the public from including a most wholesome article of food in their dietary and tend therefore to favour malnutrition, particularly of the younger members of the community. I am fully prepared to meet this criticism. We English are often accused of shutting our eyes to facts, and perhaps justly so. Without wishing to lay undue stress on the danger of milk, I want to leave no one under any misapprehension of the potential infectivity of raw milk, even that coming from graded herds. Until this fact is generally appreciated and steps are taken to render milk safe for human consumption, the position with regard to milk cannot be considered as other than highly unsatisfactory.

## Pasteurisation

What we must demand is clean and safe milk. Clean milk can be obtained even in unfavourable surroundings from animals with healthy udders by practising a few simple hygienic precautions, such as washing of the hands and udder and sterilisation of all utensils. Safe milk can be obtained at present only by heat treatment. If adequately performed, it appears that low-temperature pasteurisation by the holder method can be relied upon for the destruction

of all pathogenic micro-organisms in milk. The alteration in nutritive properties caused by this process is very slight, and so far as we know consists almost entirely in a diminution in the vitamin-C content, which can be easily remedied by the addition of fresh orange juice to the diet.

Many objections have been raised to pasteurisation, but in practice it has worked remarkably well. In the United States of America an average of about 88 per cent. of the milk in the cities with a population of 10,000 and over is pasteurised, while in the cities with a population of 500,000 and over, 98 per cent. is pasteurised (Frank and Moss). It is interesting to note that in the United States milk-borne epidemics are becoming more and more restricted to the small country towns and rural districts, where most of the milk is consumed raw; from the large cities they have been practically banished (Report, 1931). In Toronto the careful work of Price has brought very strong evidence in favour of the efficacy of pasteurisation. Of 220 juvenile patients suffering from some form of tuberculosis 190 proved to be infected with the human and 30 with the bovine type of bacillus. Without exception the 30 cases of bovine infection were in children who had come from districts of Ontario where milk was consumed raw. In Toronto, where compulsory pasteurisation has been in force since 1915, not a single case of infection with the bovine type was found.

In this country pasteurisation is extensively practised in some of the larger towns, such as Manchester, Salford, Portsmouth, and Glasgow, while in London, thanks to the voluntary efforts of the larger dairy companies, 95 per cent. of the milk is treated by this process. As an indication of its protective value I may quote some interesting figures referring to the incidence of undulant fever, a disease which I have been studying for some years. Altogether in London nine cases have been detected. One case occurred in 1917 before pasteurisation was common. Four patients had returned from a holiday in the country; one of them had consumed raw goat's milk and three raw cow's milk from the local farm. Only four patients were apparently infected in London itself, and of these two drank Certified, one Grade A raw, and one ungraded raw milk. Not a single case therefore has been recorded in a person who habitually drank pasteurised milk, and this fact is true not only for London but for the whole of Great Britain. It is probably because most of the milk in London is pasteurised that the number of cases of undulant fever has been so small.

## Constructive Proposals

As my contribution to the subject of milk production and distribution in relation to nutrition and disease, I should like to make the following constructive proposals:—

(1) All milk in urban areas of sufficient size to enable satisfactory control to be exercised should be subject to compulsory grading. At present only a small fraction of the total milk-supply is graded. The remainder is simply "milk" which is not obliged to conform to any standards of cleanliness or safety whatever. The Milk and Dairies (Amendment) Act, 1922, and the Milk (Special Designations) Order, 1923, made under Section 3 of this Act, suffer from the defect that they penalise the highest grade of producer, insisting on his paying a licensing fee to produce clean milk, and on his conforming to rigid regulations and standards for the breach of which he is liable to legal interference. The stimulus, therefore, to produce high-grade milk is not at the moment a strong one. Under a system of compulsory grading, standards would be laid down to which even the lowest grade would have to conform. By gradually raising the level of these standards it should be possible, as American experience has shown, to bring about a gradual improvement in the cleanliness of the milk-supply.

(2) Powers of compulsory pasteurisation of all milk should be given to any of the larger urban authorities applying for them. For the sake of expediency it might be desirable to make an exception for milk coming from tuberculin- and *abortus*-tested herds, though, as has been pointed out, such milk is still subject to contamination from human sources. The success of this measure will depend to a considerable extent on the care with which pasteurisation is carried out. It is becoming increasingly clear that pasteurisation can be effective in destroying all pathogenic organisms only if it is performed in a plant free from defects of design or structure, and by operators who are skilled and under constant supervision. At present a considerable amount of milk is pasteurised by wholly unsuitable methods, with the result that not all so-called pasteurised milk is free from tubercle and other pathogenic bacilli. If permissive powers of compulsory pasteurisation are to be granted, the local authority, acting on the advice of the Minister of Health, should refuse to license plants which are of unsuitable design or which experience has shown to be inefficient in operation, and the onus should be put on the local authority for the control of every plant within its area. Furthermore all pasteurised milk should be so labelled and, with the exception of sterilised milk, it should be made an offence to sell milk which has been heated in any other manner than that prescribed by the official order for the time being.

(3) In order to stimulate the demand for clean milk a prepasteurisation standard should be laid down to which all milk which is to be pasteurised must conform. The exact nature of this standard would obviously have to be discussed with care. If at the same time as this measure was introduced the larger dairy companies would adopt a system of payments favouring the clean producer and penalising the unclean producer, there would be added to the necessary legal sanctions the powerful stimulus of economic reward.

I have said nothing about the eradication of tuberculosis, contagious abortion, or mastitis from cattle, partly because they are veterinary problems and are a sufficient menace to the health of the animal population to be dealt with on their own account by the Ministry of Agriculture, and partly because their eradication must be a matter of long years, and we cannot expose the public to constant danger while this is being accomplished. In any case, even if the cattle were freed from udder disease, pasteurisation would still be desirable—at least in the larger urban areas—to guard against the infection of milk from human sources.

The milk consumption in this country is low compared with that in many other parts of the world, and in my opinion will continue to be so as long as potentially dangerous raw milk is the only milk available to a considerable section of the general public at a reasonable cost. If the farmers make a serious attempt to produce clean milk, and if Parliament will grant urban authorities the power to insist that all liquid milk sold for human consumption shall be pasteurised, the time will come when the medical officer of health will feel free at last to recommend the unrestricted use of milk as a food

and a beverage without incurring, as he does at present, the moral responsibility for endangering the health of those under his care.

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## IRELAND

(FROM OUR OWN CORRESPONDENT)

### ELECTION FOR THE UNIVERSITY OF DUBLIN

THE election of a representative of Dublin University in the Dáil in place of the late Sir James Craig is likely to take place in the last week of the present month. Two candidates have issued addresses to the electors—Mr. Kenneth Dockrell, K.C., and Dr. Robert J. Rowlette. Each of the candidates, in his address, emphasises his interest in questions of health. Mr. Dockrell asks for a return to the old custom of the University choosing as one of its representatives a member of the legal profession, and he suggests that the representatives should not necessarily be members of the college staff. On the other hand, Dr. Rowlette, who is King's professor of materia medica in the School of Physic, reminds the electors that for the past 15 years they have consistently chosen one of their representatives from the largest of the professional schools, and he emphasises the point that the care of health is one of the most important duties of the State. The voting at the election is by post. All those who are on the register are entitled to vote, whether resident in the Irish Free State or not, and as a matter of fact a large proportion are resident in Great Britain or Northern Ireland.

### POST-GRADUATE COURSES AT BELFAST

For some time past lectures for post-graduates have been given weekly at the Royal Victoria Hospital, Belfast. This year, however, the University was approached by the authorities to arrange an intensive course for insurance practitioners on a bigger scale. It was decided that the last fortnight of September, just before the opening of term, was the most suitable time. Dr. R. H. Hunter undertook the duties of secretary, and a syllabus was drawn up to include instruction in clinical medicine, minor surgery and surgical diagnosis, venereal diseases, skins, and ophthalmology. This part of the instruction was given at the Royal Victoria and Mater Infirmorum Hospital in the mornings. In the afternoons the University undertook lectures and demonstrations in pathology, applied biochemistry, anatomy, and public health. The course began on Sept. 18th, over 50 practitioners being in attendance. They were divided into two groups and attended the wards and out-patient department alternately during the mornings. Emphasis was laid on diagnosis and treatment and the actual demonstration of selected cases. Outstanding features of the afternoons spent at the University were the set discussions on medical and surgical cases, which provoked much interest and led to good discussions. Towards the end of the course the practitioners entertained those who had taken part in the work of teaching and organising. Dr. J. W. Dawson, of Newtown Hamilton, presided, and Mr. J. M. Andrews, the Minister of Labour, was present. The gathering closed what had been a very pleasant experience for all concerned. It is hoped that a similar course will be held next year.

## MEDICINE AND THE LAW

### Statement Refused to Coroner's Officer

A CORONER has a statutory duty to examine at an inquest "all persons who tender their evidence respecting the facts, and all persons having knowledge of the facts whom he thinks it expedient to examine." For convenience he usually obtains information in advance as to the names of prospective witnesses and the nature of their evidence, using for this purpose the services of the coroner's officer. The coroner's officer is entirely unknown to the law, but partly perhaps because he is often a policeman it seldom occurs to anyone to challenge his status or authority. At a recent inquest, arising out of the killing of a man by the woman pilot of an aeroplane used for exhibition flights at Barmouth, the coroner for Merionethshire is reported to have commented severely on the fact that the pilot had been advised by her legal representative not to make a statement to the coroner's officer. The coroner is said to have described this advice as the worst possible, because the result was an impression that there was something to be concealed. The comment has caused legal practitioners to protest that the giving of such statements is quite voluntary, and that circumstances may well justify refusal. Naturally, folk who think the facts may expose them to a criminal charge take legal advice at an early stage; they are probably advised to keep their mouths shut. The conditions of insurance policies have some influence in the same direction. If the coroner's officer turns out to be a policeman (in the Merionethshire case he seems to have been the chief constable of the county in person) the tendency to reticence may be strengthened. Nobody can refuse to give evidence at an inquest on the ground of exposure to self-incrimination. He cannot escape being sworn, but thereafter can claim such privilege as the law permits. In one of the leading cases associated with the original Thomas Wakley's name the High Court confirmed the principle that witnesses in a coroner's court are not bound to incriminate themselves, and must guard their own interests when they give evidence. As regards statements of prospective evidence, however, it would seem that solicitors have a perfect right to advise a client to say nothing. They might even argue that the coroner's comment on the exercise of the right of preliminary silence is possibly unfair to anyone whose conduct may be called in question. The Court of Criminal Appeal not long ago pointed out that in a case where a man had a statutory right to defer his defence his exercise of that right must not be relied upon as corroboration of an accusation.

### "Physio-medical" Treatment

An inquest was held near Manchester last week by Mr. R. Stuart Rodger upon the death of a 6-year-old girl who had been treated by Mr. C. C. Abbott, the "physio-medical practitioner" of Leigh, whose

use of a form of the Abrams box has been discussed on similar occasions in the past. Mr. Abbott, in his evidence, said the patient had suffered from pleurisy, and there were indications of empyema in the right lung. He found no definite indications of pus. He did not make a bacterial examination; he put a sample of blood into his machine to see if the child was anæmic. Dr. B. Sandler, senior resident medical officer at the Park Hospital, Davyhulme, described the results of his post-mortem examination. The child was suffering from pericarditis, chronic congestion of the kidneys, and general blood poisoning. There was an abscess on the right lung and another outside the heart-bag; he found six or seven ounces of pus, which must have taken seven or eight weeks to accumulate. External treatment and "physio-medical" treatment, such as had been described, could have had no effect on an abscess which required opening. He thought that with proper treatment she would have recovered. In answer to a specific question from the coroner, Dr. Sandler said in his opinion the child had been neglected; if he himself had treated a patient in a similar manner he would consider he had been guilty of criminal negligence; if the empyema had been properly treated the child's life would probably have been saved. Mr. Abbott protested that it was unfair that he was not invited to be present at the post-mortem examination. He had perhaps a stronger grievance when the coroner refused to allow him to put a question to Dr. Sandler. Mr. Rodger said he could not permit one witness to cross-examine another. If, however, A is giving evidence of criminal negligence against B, it is surely not unusual to allow B to ask A questions. The coroner, summing up the evidence to the jury, said he could not judge of Mr. Abbott's experience, but in this case Mr. Abbott had failed to ascertain the root cause of the child's protracted illness which had proved fatal. It was obvious from the evidence that Mr. Abbott had made a mistake; we were all liable to make mistakes—and mistakes might cost a life. He did not think Mr. Abbott made a criminal mistake; he recommended the jury to return a verdict of "death from natural causes." The jury did so, adding a rider that the parents would have been well advised to have called in a medical practitioner, other than Mr. Abbott, at a much earlier stage of the illness.

## THE MEDICAL DEFENCE UNION

THE annual general meeting of the Medical Defence Union was held at 49, Bedford-square, London, W.C.1, on Thursday, Sept. 28th; Dr. W. S. A. Griffith, the president, in the chair, and 23 other members were present. In moving the adoption of the annual report of the Council for the year 1932–33, Dr. Griffith said that the general body of members knew little how strenuous was the work of their Council, and that a vote of thanks to them for that work should be no formal expression. The only important branch of professional work not represented on the Council was dentistry, an omission that they were ready to remedy. He continued: "Our membership has increased, our financial position is satisfactory, and our success in dealing with cases in which our assistance has been sought has, on the whole, been most gratifying. In one case where damages were claimed against two of our members an adverse decision was given, but by those who know the facts the verdict will always be regarded as a miscarriage of justice. Unfortunately we were unable to take further action as we were advised that an appeal had little chance of success. I can assure you that no effort is spared to provide our members, when attacked, with the best defence obtainable. This is fully appreciated by the vast majority of our members, and it is a very rare occurrence for a member to question the steps taken on his behalf." Dr. Griffith, however, then referred to a case where a provincial member asked for legal assistance in connexion with an inquest to be held in two days' time; prompt steps were taken to instruct a local firm of solicitors known to the Union, but the member pressed that his own solicitor should coöperate with them and take part in conference with counsel. When it was explained that the responsibility for the defence must rest solely with the Union's legal advisors, the member took the case out of the hands of the Union and instructed his own solicitor, subsequently complaining of the inadequacy of the protection afforded to provincial members. A sub-committee appointed to investigate the facts came unanimously to the conclusion that every step necessary for the protection of the member's interests had been taken, and that the member's natural anxiety in the matter had led to misunderstandings which would not otherwise have occurred.

During 1932 1681 new cases were dealt with by the Union, which, said Dr. Griffith, gave an average of over five on each working day in the year. Some of these cases were trivial and could be disposed of by letter, but others might involve correspondence extending over weeks and even months. Having had many opportunities during many years of seeing the way in which the business of the Union is handled by the staff, he doubted if any organisation could be better conducted, owing to the admirable organising ability of the secretary. A new sublease from Epsom College of the whole of the ground floor and part of the basement of 49, Bedford-square had provided valuable accommodation for the work, and Dr. Griffith expressed the gratitude of the Union to the College authorities for the consideration shown. Dr. Griffith concluded: "In two years' time the Union will reach its Jubilee, and I hope members will find some way of celebrating this and of placing on record their appreciation of the satisfactory progress the Union has made since its inception. Few of those who laid the foundations of this great enterprise have lived to see its fruition, but we all may be justly proud of the invaluable work that has been accomplished."

The report of the Council and financial statement for the year 1932 were then adopted. Dr. Henry Robinson, Mr. E. Pearce Gould, and Dr. Elizabeth Bolton, who retired under Article 28, were re-elected. The auditors, Messrs. Lewis, Hardy and Co., were reappointed, and a vote of thanks to the president and the Council for their services during the past year was carried with acclamation.

WARRINGTON INFIRMARY NURSING-HOME.—A booklet has been issued explanatory of the arrangements connected with the recently opened private nursing-home attached to this hospital. There is accommodation for 25 patients, 7 in two semi-private rooms and the rest in single rooms. The charge for a bed in the semi-private ward is three and a half guineas a week, and from five guineas upwards for a separate room. These charges include board, ordinary medicines, dressings, services of nurses, and use of the theatre. Patients can be attended by their own medical man, the hon. medical staff having no responsibility except by arrangement with the medical attendant.

# UNIVERSITY OF BRISTOL

## INAUGURATION OF THE DEPARTMENT OF PREVENTIVE MEDICINE

On Sept. 29th the new department of preventive medicine was formally opened by the Minister of Health, Sir Hilton Young, in the presence of the Vice-Chancellor and other officers of the University, the medical officers of health to the city, and representatives of most of the neighbouring local authorities. The department has been established to undertake public health laboratory work for the West of England. The work for the city of Bristol was originally carried out in the university college, from which the University of Bristol arose, and was later taken over by a municipal laboratory. Its execution in the new department has been rendered possible by a new agreement between the University and the city council.

The Minister of Health, in formally declaring the new department open, said that he had opportunities to discern the need for the avoidance of waste in the use of the forces which make for the better physical welfare of the community. It sometimes occurred that there was no coördination between essential forces working for the same end, such as the University with its scientific knowledge and the city with its municipal authority. He therefore congratulated those concerned on their foresight and wisdom in bringing about this coördination in Bristol and on their devotion to the public interest in putting this ideal before their individual interests. The Minister stressed once again the importance of preventive rather than remedial medicine. While not for a moment depreciating the great remedial services, he felt that if we could devote more of our energy in the shape of funds, public and private, to preventive medicine, we should increase the efficiency of the nation.

After the opening ceremony the guests were entertained by the University to luncheon in the Students' Union, when Prof. R. H. Parry spoke of the unrivalled opportunities for research available to

One of the Laboratories.

the members of the department, and of the laboratory facilities offered under the new scheme to every general practitioner in the area.

The department is housed in Canynge Hall, which occupies the whole frontage of Whiteladies-road between Whatley-road and the road to Clifton Down Station, and is situated about half a mile from the main University buildings. Canynge Hall is a large stone building of four stories and basement which was originally built as a hotel, and was then purchased by the University and used as a residential hall for men students. It has now been reconditioned to house most of the medical departments of the University. The ground floor accommodates those of medicine, surgery, obstetrics, and pathology, and two lecture rooms for the common use of these departments. The first floor is devoted entirely to the department of preventive medicine, and on the second floor research rooms for the departments of medicine, surgery, obstetrics, and pathology have been provided,

The Main Block.

[*Photographs by F. Bromhead, Bristol.*

while space has been reserved for a department of analytical chemistry which it is hoped to establish soon. In the basement rooms are devoted to the inoculation and housing of laboratory animals and to the preparation and storage of media. The whole building is fitted with central heating by an efficient gas plant.

The department affords modern facilities for the laboratory investigation of various pathological conditions and foodstuffs, and includes fully equipped histological, bacteriological, serological, and biochemical laboratories, in addition to rooms for taking specimens directly from patients. A special room is devoted to milk examinations. Provision has also been made for expeditious reports on specimens and for the keeping of records. An up-to-date library facilitates access to relevant literature. Dr. I. Walker Hall, who has been succeeded in the University chair of pathology by Prof. Geoffrey Hadfield, and who has been responsible for the planning of this new extension of the medical school, has been appointed director of the department and curator of Canynge Hall; Dr. R. H. Parry, the medical officer of health for the city, holds the chair of preventive medicine; and the senior and junior pathologists are respectively Dr. Allan Gray, formerly assistant bacteriologist in the city of Liverpool bacteriological laboratories, and Dr. Doris Stone.

On the day of the opening and on the day following the laboratories were open for inspection. Demonstrations included tests for the differentiation of raw from pasteurised milk, and the processes relating to examinations to detect ropy and bleeding bread, the carriage of infection by flies, and tuberculous milk. A number of large histological microphotographs used in the teaching of pathology were on view. Lantern demonstrations on the History of Surgery and of Obstetrics were also held and were evidently appreciated.

# THE MEDICAL REGISTER

## UNTRACEABLE PRACTITIONERS IN 1933

WE are asked by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone, wherever resident, who finds his or her name included in this list should communicate immediately with the Registrar, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register. There may be some who have replied while this list was in the press. The date given is that of registration; the qualification is the principal one registered. The letters (E), (S), and (I) denote registration at the English, Scottish, or Irish branches respectively; (Col) and (For) denote registration in the Colonial and Foreign Lists of the Register. Those marked (S) should communicate direct with the Registrar of the Scottish Branch Council, 12, Queen-street, Edinburgh.

Arnott, Grant, M.B., 1897(E).

Banatvala, Sir H. E., M.R.C.S., 1882(E).
Bester, Pieter, M.B., 1926(E).
Blackall, Patrick, M.D., 1885(I).
Brookes, Robert, L.M.S.S.A., 1900(E).
Brown, Wilbert H., M.R.C.S., 1927(E).
Burchell, Ernest, M.R.C.S., 1888(E).

Clarke, John J., M.R.C.S., 1915(E).
Cline, Eric C., M.R.C.S., 1915 (E).
Conlin, Patrick J., M.B., 1920(I).
Cooper, Richard A., L.R.C.P. & S., 1921(S).
Cresswell, Norman, L.A.H., 1926(I).
Crouch, Ernest J., M.R.C.S., 1875(E).

de Wytt, William H., M.B., C.M., 1895(S).
Dorsch, Carl E., M.B., Ch.B., 1922(S).

Fell, Walter, D.M., 1881(E).
Fraser, George J. M., L.R.C.P. & S., 1911(I).

Garde, Henry C., F.R.C.S., 1878(I).

Hannesson, Hannes, M.R.C.S., 1927(E).
Harrison, Sydney G., M.R.C.S., 1900(E).
Henderson, Archibald, M.B., 1928(E).

Javitz, Leon, M.D., 1915(For).
Jones, David W., M.R.C.S., 1914(E).

Kendrick, Montford A., M.C.P. & S., 1916(Col).

Lebon, Camille, M.R.C.S., 1906(E).
Legh, Harry L. de, M.R.C.S., 1889(E).

McAlister, Hector C., M.R.C.S., 1920(E).
McArthur, Arthur N., M.R.C.S., 1895(E).
MacAulay, Ambrose, L.A.H., 1922(I).
McBurney, John H., M.B., 1895(I).
McCartan, Patrick, L.R.C.P. & S., 1910(I).
McCarthy, Daniel T., M.B., 1922(I).
McCarthy, Ellen, M.B., 1926(I).
McCarthy, Randal, L.R.C.P. & S., 1892(I).
McCaughey, John G., M.D., 1902(S).
MacConaill, Michael A., M.B., 1925(I).
McConkey, John T., L.R.C.P. & S., 1915(I).
MacDermot, Edward C., L.R.C.P. & S., 1909(I).
McDermott, Jane M., M.B., 1926(I).
McDermott, Patrick A., F.R.C.S., 1880(I).
MacDonald, Herman A., M.B., 1893 (E).
McDonnell, John T., L.R.C.P. & S., 1917(I).
McElroy, Lilian, M.B., 1929(I).
McEnroy, Margaret, M.B., 1926(I).
McEntire, Ronald G. J., M.B., 1912(I).
McEntire, Samuel D. G., L.R.C.P. & S., 1914(I).
MacGeagh, Thomas E. F., M.R.C.S., 1878(E).
McGeorge, Margaret T., M.B., Ch.B., 1918(S).
McGillivray, Donald, M.R.C.S., 1900(E).
MacGuire, Constantine J., L.R.C.P., 1869(I).
MacHado, Leon S., F.R.C.S., 1911(E).
McIlvean, Douglas D., M.B., Ch.B., 1924(S).
McInnis, Archibald, M.R.C.S., 1915(E).
MacIntyre, Marion, M.B., Ch.B., 1910(S).
MacKay, Harvey, L.R.C.P. & S., 1905(E).
MacKen, Hubert, M.B., 1918(I).
McKenna, Francis H., M.B., 1925(I).
McKenna, Peter, M.B., 1888(I).
MacKenzie, Donald, M.B., Ch.B., 1928(S).
McKnight, Maude W. (now Mrs. Henry), M.B., 1922(E).
McLaughlin, Agnes, M.B., 1923(I).
MacLaughlin, Thomas, L.R.C.P., 1875(I).
MacLaughlin, Thomas H. K., L.R.C.P. & S., 1918(I).
McLean, James Y., L.R.C.P. & S., 1916(S).
MacLeod, Murdoch H., M.B., Ch.B., 1913(S).
McLeod, Thomas H., M.R.C.S., 1917(E).
MacMahon, Augustine P., M.B., 1907(I).
McMahon, John R., M.B., 1919(I).
McMenamin, John G., M.R.C.S., 1924(E).
McMurray, Wahab, M.D., 1881(I).
McMurtry, Walter C., M.R.C.S., 1913(E).
McNamara, Peter P., M.B., 1922(I).
MacQuillan, John W., M.B., 1881(I).
MacSweeny, John A., L.R.C.P. & S., 1917(I).
Madan, Hans R., M.B., 1921(E).
Maguire, Hugh G., L.R.C.P. & S., 1925(I).
Malik, Hatimbhai S. A., M.B., 1930(E).
Malkani, Shawkiram S., M.R.C.S., 1916(E).
Manley, Henry C., L.R.C.P., 1866(I).
Mann, Alexander, L.A.H., 1909(E).
Marquess, Thomas, M.B., 1926(I).
Marsack, Arthur E., L.R.C.P., 1883(E).
Martin, Francis A., M.B., 1928(I).
Martin, Harold P., M.R.C.S., 1905(E).
Martin, Henry O., M.B., 1926(E).
Martin, John E., M.B., C.M., 1896(S).
Masina, Dinshaw M., M.R.C.S., 1922(E).
Mattei, Charles, L.R.C.P. & S., 1888(E).
Matthews, John, *D.S.O.*, M.R.C.S., 1899(E).
Matthews, John B., *M.C.*, M.R.C.S., 1914(E).
Maurer, Hy. W., L.M.S.S.A., 1930(E).
Maxton, Archibald, L.R.C.P. & S., 1926(S).
Maye, John, M.R.C.S., 1882(E).
Mejias, Andrew, L.R.C.P. & S., 1929(I).
Membery, Giles G., L.S.A., 1900(E).
Menary, Vera G. M. (now Mrs. Burford), M.B., 1922(I).
Menon, Eleyedath K. K., M.R.C.S., 1931(E).
Menon, Karamathil P. G., L.R.C.P. & S., 1929(I).
Mikhail, Hakin M., M.R.C.S., 1928(E).
Miller, William, M.B., Ch.B., 1901(S).
Mills, Ieuan A., M.R.C.S., 1927(E).
Mills, John, M.B., 1890(I).
Miryiees, Oswald M., M.B., Ch.B., 1905(S).
Mohamed, Farid, M.R.C.S., 1917(E).
Mohan, Peter, L.R.C.P. & S., 1902(S).
Moloney, Patrick O'D., L.R.C.P., 1882(E).
Molony, Patrick B., L.R.C.P. & S., 1896(I).
Monod, Gustave J. P., F.R.C.P., 1910(E).
Moore, Arthur R., L.R.C.P. & S., 1892(I).
Moore, Edgecumbe W., M.B., 1913(E).
Moore, Francis J., L.R.C.P. & S., 1902(I).
Moore, Frederick F., L.R.C.P., 1876(I).
Moore, Peter H. L., M.R.C.S., 1926(E).
Moorhead, Andrew S., M.R.C.S., 1911(E).
Moran, Michael J., M.B., 1885(I).
Moreland, George, M.B., C.M., 1898(S).
Morressy, Patrick T., L.R.C.P., 1886(I).
Morrison, Cecil J. R., L.R.C.P. & S., 1925(S).
Morrison, Elizabeth, M.B., 1922(I).
Mortimer, Hector, M.B., Ch.B., F.R.C.S., 1914(S).
Mortlock-Brown, Constance A., L.M.S.S.A., 1917(E).
Moshal, Bernard, M.B., 1920(I).
Moss, Edith M. N., M.B., 1913(E).
Mostert, Hendrik Van R., M.B., 1925(E).
Mullarky, Robert E., L.R.C.P. & S., 1931(S).
Muller, David V., L.S.A., 1901(E).
Mullins, Patrick J., M.B., 1928(I).
Murnane, Helen M., M.B., 1920(I).
Murphy, Jeremiah F., M.B., 1923(I).
Murphy, John P., M.B., 1924(I).
Murray, Francis X., M.B., 1920(I).
Murray, Jeannie R., M.B., 1906(I).
Murray, John M., M.B., 1927(I).
Murray, Joseph, M.B., 1920(I).
Murray, Lilian M. S., M.B., 1928(E).
Myer, Leonard, M.R.C.S., 1906(E).
Myers, William G., L.R.C.P. & S., 1927(I).

Naik, Naranji R., M.R.C.S., 1912(E).
Nat, Bhagwant S., F.R.C.S., 1926(E).
Natesan, Tharmalingam K., L.M.S.S.A., 1925(E).
Neary, James F., M.B., 1908(I).
Neatby, Andrew M., L.R.C.P. & S., 1887(E).
Nel, Jacobus G., M.R.C.S., 1919(E).
Nelson, Cecil, M.B., 1921(E).
Nelson, Henry R., M.D., 1903(I).
Nelson, Thomas C., L.F.P.S., 1875(E).
Newman, Freda, M.B., 1917(E).
Newton, Henry A., L.R.C.P. & S., 1925(S).
Newton, John P., L.R.C.P. & S., 1905(S).
Nichol, Robert, M.B., C.M., 1892(S).
Nichol, Robert W., M.R.C.S., 1922(E).
Nicholson, John W., M.R.C.S., 1883(E).
Nixon, Arthur P., M.R.C.S., 1898(E).
Nolan, Andrew, M.B., 1929(I).
Nolan, Herbert F., L.R.C.P. & S., 1894(I).

Oakley (Mrs.), Mary A. (formerly van Ingen), M.B., 1913(E).
O'Brien, Catherine M., M.B., 1925(I).
O'Brien, Kathleen, M.B., 1927(I).
O'Brien, Michael J., L.R.C.P. & S., 1894(I).
O'Callaghan, Jeremiah, L.R.C.P., 1883(I).
O'Callaghan, Patrick, L.R.C.P. & S., 1927(I).
O'Connor, Carl, L.R.C.P. & S., 1918(I).
O'Connor, Gladys C. J., L.R.C.P. & S., 1920(I).
O'Connor, Roderick, L.A.H., 1911(I).
O'Doherty, Colman P., M.B., 1920(I).
O'Doherty (Mrs.), Maggie I., M.B., 1918(I).
O'Doherty, Vincent J., M.B., 1922(I).
O'Donoghue, Thomas F., L.R.C.P. & S., 1915(I).
O'Driscoll, John A., L.R.C.P. & S., 1914(I).
O'Driscoll, Thomas J., M.B., 1924(I).
O'Hagan, Patrick J., L.R.C.P., 1876(I).
O'Halloran, Anna M. K., M.B., 1917(I).
O'Keefe, Catherine R., M.B., 1925(I).
O'Keeffe, Edward J., M.B., 1914(I).
O'Keeffe, Eileen M., M.B., 1912(E).
O'Kelly, James J., M.B., 1909(I).
O'Mahony, Michael C., M.B., 1923(I).
O'Mahony, Nora, M.B., 1924(I).
O'Mahony, Thomas, M.B., 1916(I).
O'Neill, Cyril A., M.B., 1924(I).
O'Neill, Eileen M., M.B., 1926(I).
Orden, Joseph, M.B., Ch.B., 1923(S).
O'Reilly, Myles W., M.D., 1880(E).
Osbourne, Arthur B., L.M.S.S.A., 1925(E).
Oserovitz, Abraham, M.B., 1925(E).
O'Sullivan, Eileen A., M.B., 1925(I).
O'Sullivan, Joseph E., M.B., 1913(I).
O'Sullivan, Peter F., M.B., 1922(I).
O'Toole (Mrs.), Annie (formerly Cullen), M.B., 1924(I).
Owen, Charles A., F.R.C.S., 1889(E).

Pandya, Devi D., L.R.C.P. & S., 1901(E).
Panikker, Aerath N. N., M.R.C.S., 1919(S).
Paranjape, Ramchandra G., L.R.C.P. & S., 1929(E).
Parbury, Frederic D., M.R.C.S., 1902(E).
Park, James, M.B., 1915(I).
Parkinson, Malcolm, M.B., C.M., 1892(S).
Paterson, William L., *M.C.*, L.R.C.P. & S., 1916(S).
Patterson, Herbert C., L.R.C.P. & S., 1924(I).
Payn, John R., M.B., Ch.B., 1919(S).
Pearse, Frank, M.R.C.S., 1884(E).
Pearson, David C., M.B., 1904(I).
Pedlow, Charlotte, M.B., 1918(I).
Petit, Joseph, L.R.C.P., 1871(I).
Philip, Baddelianage D. H., M.R.C.S., 1914(E).
Phillips, Lionel L., M.R.C.S., 1907(E).
Phipps, George C., L.R.C.P. & S., 1924(I).
Pierce, Michael J., L.R.C.P. & S., 1908(I).
Pincus, Jos. V., M.B., 1926(I).
Plunkett, Bernard, L.R.C.P. & S., 1925(I).
Pollock, Aubrey K. H., M.R.C.S., 1902(E).
Pratt, William S., M.R.C.S., 1884(E).
Priest, James D., *M.B.E.*, M.R.C.S., 1879(E).
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Profeit, Alexander C., M.B., C.M., 1899(S).
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Pybus, John A., L.R.C.P., 1878(I).

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Quinn, Mary P., M.B., 1923(I).
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Race, Edmund, M.B., 1893(E).
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Ram Chandra, Ari K., L.M.S.S.A., 1929(E).
Rand, Richard F., M.D., 1882(S).
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Reynolds, William H., M.R.C.S., 1929(E).
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Robertson, Susie A., M.B., Ch.B., 1917(S).
Robertson, William R., L.R.C.P. & S., 1923(S).
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Roddy, Patrick J., L.R.C.P. & S., 1921(I)
Rodger, Robt. S., M.B., 1895(E).
Rodriguez, Rafael M., L.M.S.S.A., 1921(E).
Rosair, Harry B., L.A.H., 1911(I).
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Ryde, Cyril A., M.R.C.S., 1891(E).

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Savage, Richard G. A., M.B., Ch.B., 1927(S).
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Sheehy, William H. P., M.R.C.S., 1874(E).
Simpson, Robert W., M.B., Ch.B., 1904(S).
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Stephen, Leslie D., M.B., Ch.B., 1909(S).
Stewart, James, M.B., Ch.B., 1929(S).

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# ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE

THE Old Students' Dinner, held as usual in the Great Hall of St. Bartholomew's Hospital, provided an opportunity for enlisting public support for the development of the Medical College on the site of the Merchant Taylors' school in Charterhouse-square.[1] The dinner took place on Oct. 2nd, Lord Horder presiding, and the Prime Minister was the guest of honour. The Prince of Wales sent the following message which was read by the chairman :—

"Not only as president of St. Bartholomew's Hospital, but as a 'perpetual student' of the Medical College, I send my best wishes to all present at to-night's dinner. I welcome the decision to take advantage of the opportunity of moving to the site of Merchant Taylors' School, thus providing for the needs of the college, while at the same time vacating space which will be required for the extension of the hospital. I am glad to hear of the amount already raised towards the cost of the new college buildings, and wish all success to the present appeal. I hope that it will not be long before the students are settled in the residence that is to be provided for them, and I feel confident that the college, in its new home, will continue to play the great part for which, as the largest medical school in England, it is distinguished in the fields of medical education and research."

### THE NEW DEVELOPMENTS

The Prime Minister, in proposing the toast of The Medical College, spoke of its history. He was one of those who worshipped old things of great repute. Everybody associated with the institution had good cause to be proud of it. Referring to the chairman, he said that it was the duty of the Minister responsible to suggest no honour for those who had not previously honoured themselves. Lord Horder had won his title by his attainments. This was a time when the medical profession had to go ahead. The fine old village doctors were a wonderful lot of men, but science and medicine were extending their field and their problems every day, and medical education had to keep pace. A new outlook was required, and he was extremely glad that St. Bartholomew's had embarked upon its venture of purchasing the site of the old Merchant Taylors' school, and hoped with all his heart that it would succeed.

Mr. W. Girling Ball, dean of the Medical College, said that the maximum number of students who could be admitted to the college in any one year was 130. During the last three years the maximum had been reached, so that at the present time there were something like 800 students annually within the hospital walls. Some 86 per cent. of these students were reading for university degrees; the remainder were mostly seeking the diplomas of the Conjoint Board, a large proportion of them being colonial students belonging to universities whose preliminary examinations were not recognised by universities in this country. The student who had trained himself to this standard had the right to demand a high medical education. To meet his needs the Merchant Taylors' school site had been acquired, and its acquisition marked a new era in the history of the Medical College of St. Bartholomew's Hospital. Its beginnings had been small, a single room and a museum having been granted by the governors of the hospital for the purpose of teaching. Fifty years later a new school was built, and now further expansion was urgently needed, not only to free the land on which the school now stands for the further development of the hospital, but also to meet the modern requirements of medical education. So rapid had been the progress of medical science, and so complicated had become the methods of diagnosis and treatment of the patients, that the teachers of the preclinical studies had had to alter materially their courses of teaching so as to make a really sound scientific basis for the students' clinical education. The Merchant Taylors' school site was the only area available in the close proximity of the hospital to serve the purpose. Whereas a year ago not one penny of the money required for its purchase was to hand, now something like £70,000 towards the £130,000 required was secured. The decision had had to be taken promptly or the opportunity lost. The Merchant Taylors' Company had been most sympathetic and helpful in the matter, and had allowed the Medical College to take possession for a certain sum of money and had lent the remainder on mortgage. The staff of the hospital had contributed themselves £13,000, and other Bart.'s men had raised the figure to something like £26,000. This was significant, since it proved that those chiefly concerned had this matter very much at heart, and gave them a right to approach the general public for further help. He particularly wished to thank the secretaries in various counties of the kingdom who had vied with each other to raise the largest subscriptions from Bart.'s men, and the medical officers of the Services who had raised £560. The University of London had already contributed £5000 to the fund. He also wished to thank the Corporation of the City of London and some of the city companies—especially the Mercers—and various other donors who had helped to swell the fund. The site had now to be developed. The first object was so to equip the present buildings that before the end of 1934 the building which now housed the physiology and physics departments could be released for sale. In order to carry out the full scheme of reconstruction £25,000 was required. The dean appealed to the public to enable the deficit of the purchase price to be paid off, and also to raise a sum of money for carrying out the necessary reconstruction, which would maintain the traditions of the great hospital of St. Bartholomew's as the first teaching hospital in this country, and as a great national and imperial possession.

Mr. Reginald Vick proposed The Guests in happy vein, emphasising Lord Wakefield's well-known generosity in supporting scientific objects, and drawing attention to the teaching now available for students in L.C.C. hospitals. Lord Mottistone promised to enlist the help of his friends in the Isle of Wight and the county of Hampshire. Sir George Newman expressed his conviction that the step taken was a wise one, and gave the assurance of his hearty support.

Lord Horder, responding to Dr. Geoffrey Evans's admirable speech proposing his health, said that Lord Wakefield had given £1000 to the fund, Sir Alexander Grant had promised £100 a year for seven years, and longer if Lord Horder could keep him alive longer; and he had received £1000 from a grateful patient.

[1] See THE LANCET, 1932, ii., 646.

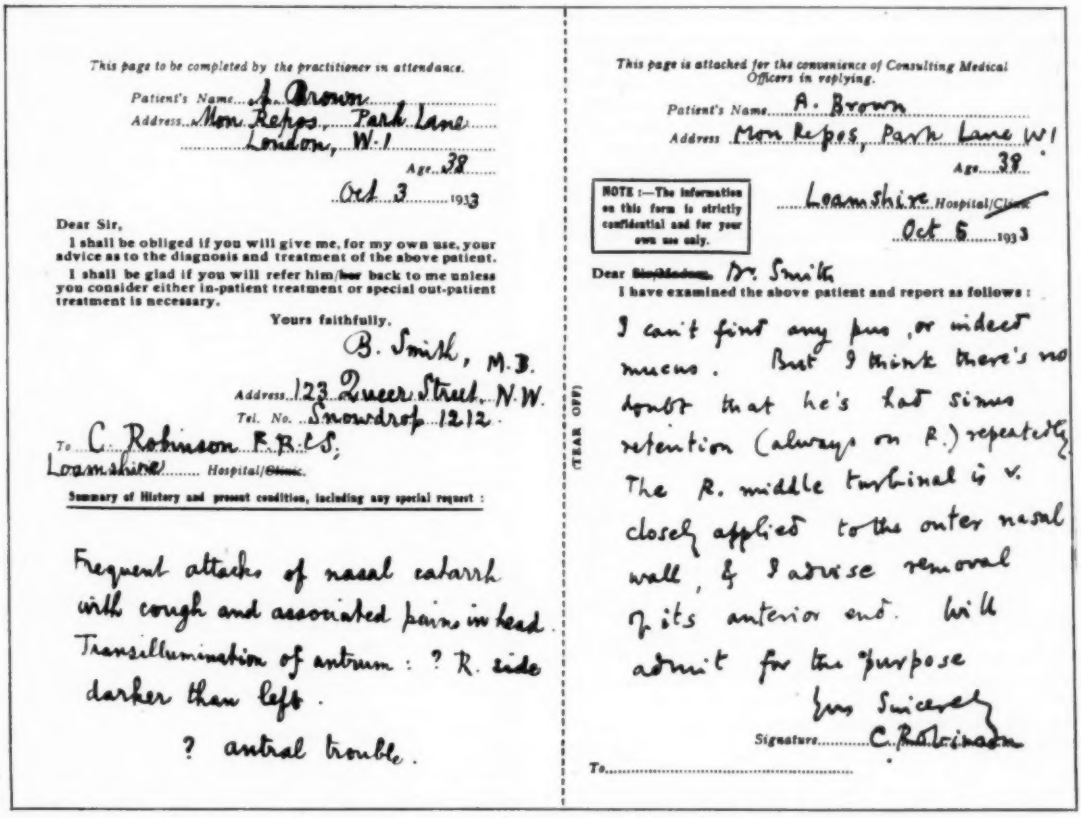
# OUT-PATIENT DEPARTMENTS

## COOPERATION WITH PRACTITIONERS

IN our first issue of this year we summarised a report by the King's Fund out-patients' committee. One of the conclusions reached was that hospital out-patient departments are treating minor cases that can be dealt with elsewhere—a state of affairs which on the one hand prevents efficiency of the departments, and on the other hand is a source of grievance to private practitioners. The obvious remedy for both complaints is better coördination between hospitals and the practitioners, and the committee warmly supported the movement towards a more consultative use of out-patient departments. It was not prepared to forbid admission to any patient who did not come in as an emergency or bearing a doctor's letter, but it urged all hospitals to discourage attendances, after the first, if the patient could possibly be treated by his private doctor.

Two important steps have now been taken to advance this coördination. The out-patients' arrangements committee, which was appointed to help in carrying out the recommendations of the committee of inquiry, is this week circulating a letter, signed by Sir John Rose Bradford, summarising the position and enclosing two documents which should be of great practical value. The Fund has not found it practicable to send a circular letter to doctors outside its area, but the documents will be supplied free to any practitioner who applies for them to the King Edward's Hospital Fund for London, at G.P.O. Box 465A, 10, Old Jewry, E.C.2.

The British Medical Association and the London panel committee had both been concerned with the problem of the out-patient before the King's Fund committee reported, and both had prepared a model form of introductory letter to be brought by an out-patient from his general practitioner. The Fund has adopted both these forms, and a copy of each is being sent out with the circular letter. The two do not differ in any material particular, and both can be obtained at 1s. a hundred from the publishing bodies (British Medical Association House, Tavistock-square, W.C.1, and Panel Committee for the County of London, 17, Russell-square, W.C.1).



*This page to be completed by the practitioner in attendance.*

Patient's Name A. Brown
Address Mon Repos, Park Lane London, W.1
Age 38
Oct 3 1933

Dear Sir,
I shall be obliged if you will give me, for my own use, your advice as to the diagnosis and treatment of the above patient.
I shall be glad if you will refer him/her back to me unless you consider either in-patient treatment or special out-patient treatment is necessary.
Yours faithfully,
B. Smith, M.B.
Address 123 Queer Street, N.W.
Tel. No. Snowdrop 1212.

To C. Robinson F.R.C.S.,
Loamshire Hospital/Clinic.

Summary of History and present condition, including any special request :

Frequent attacks of nasal catarrh with cough and associated pains in head. Transillumination of antrum : ? R. side darker than left.
? antral trouble.

(TEAR OFF)

*This page is attached for the convenience of Consulting Medical Officers in replying.*

Patient's Name A. Brown
Address Mon Repos, Park Lane W1
Age 39

NOTE :—The information on this form is strictly confidential and for your own use only.

Loamshire Hospital/Clinic
Oct 6 1933

Dear ~~Sir/Madam~~ Dr. Smith
I have examined the above patient and report as follows :

I can't find any pus, or indeed mucus. But I think there's no doubt that he's had sinus retention (always on R.) repeatedly. The R. middle turbinal is v. closely applied to the outer nasal wall, & I advise removal of its anterior end. Will admit for the purpose
Yours Sincerely
Signature C. Robinson

To

The form issued by the London Panel Committee, filled in with imaginary case notes to indicate what space is available for the purpose. The actual size of the form is about 9 in. by 6¾ in.

The form selected by the panel committee is here reproduced. The second sentence in the doctor's letter is intended to signify the willingness of the panel practitioner to continue the treatment of his insured patients unless the consultant wishes to retain them. The sheet is perforated so that the consultant can tear off his reply half; some consultants prefer, of course, to write their own private letters, but the form should in any case be useful for making notes at the time of seeing the patient. One of the suggestions of the out-patients' committee was that shorthand and typing facilities should be provided by the hospital; it may be observed, however, that the form provided would not be welcomed by a typist, for it is narrow and very little information could be squeezed on to it in type-script.

The second service which the King's Fund committee has performed is the preparation of a complete

list of out-patient attendances at the various London hospitals. Most hospitals issue their own time-tables, but the format varies from a post-card to a foolscap sheet, and some of them are not suitable for the practitioner's use. The Fund has now collected the times of the various hospital out-patient sessions in a convenient eight-page booklet, which exactly fits into the telephone directory, or can be folded in half and kept in a book of ordinary octavo size. The hospitals are arranged in alphabetical order, and after each there is a small space in which the doctor can write any notes of his own, such as the name and times of attendance of a particular consultant. This publication should be really helpful. Much hardship to the patient is saved if he can be told the precise time at which he should attend the hospital in order to have a chance of being seen in the proper department.

# PANEL AND CONTRACT PRACTICE

## Prescribing and Dispensing

THE second edition of the National Formulary came into operation on Oct. 1st, and the first edition, published in 1929, is now obsolete and must not be used. The new edition contains additions, deletions, changes of title, and changes of composition in conformity with the 1932 issue of the British Pharmacopœia, and also other changes of composition. The additions include 7 "drop" preparations, 4 lotions, and 27 mixtures; the omissions, 9 mixtures and 7 pills. Thirty-two preparations have been given a different name, often a change from B.P.C. to B.P. Furthermore, 64 preparations have had their compositions changed in order to comply with the requirements of the B.P. 1932. The book is issued by the British Medical Association for the National Insurance Defence Trust, being compiled by the Insurance Acts Committee. As before, notes on prescribing are given under three headings: (1) frequency of prescribing; (2) cost of ingredients prescribed; and (3) the dispensing fee involved. These notes touch on many important points which may easily be forgotten at the crisis of an illness, and special attention should perhaps be drawn to the paragraph on special preparations.

To avoid loss through having odd quantities of proprietary preparations left on their hands, chemists are in certain circumstances entitled to receive payment for a quantity larger than that stated on the prescription. For example, if 12 tablets of a proprietary article are ordered, but the smallest packet obtainable by the chemist is 25, he may supply and be paid for the 25. In this way the cost of proprietary prescribing is much increased. Prescriptions marked "urgent" carry double the dispensing fee that they would otherwise have, but in this connexion the public and the profession have definite ground of complaint about the dispensing service provided after hours in most areas. There seems to be no point in marking a prescription "urgent" if no chemist is ever available to make it up after hours. In the early days of the Act most chemists lived above or in touch with their shops, and it was possible to get medicines supplied outside the ordinary hours; but to-day it is quite possible to go the round of every chemist shop in a town and get no reply from any of them. This is an unsatisfactory state of affairs; on the other hand, in some areas there would be many nights when a single chemist on duty for the locality until, say, 10.30 P.M., would find very little to do.

The chairman of the pharmaceutical service subcommittee for London gave an assurance to a member of the main committee at its last meeting that he will look into the drug-testing scheme as at present administered. Perhaps he will also consider the peregrinations of an "urgent" prescription in the metropolis after 8 P.M.

## Insurance Acts Committee

*Tuberculosis and the Regional Medical Officer.*—Among important matters discussed by the Insurance Acts Committee on Sept. 21st, at the first meeting of the new session, was a suggestion that approved societies should refer cases of tuberculosis direct to the tuberculosis officers instead of to the regional medical officers. The committee had been inclined to agree to this suggestion, but the Minister of Health said he had no power to put these extra duties on tuberculosis officers without the agreement of the local authorities. He also stated that whenever a tuberculous person was found by the regional medical officer to be fit for work the tuberculosis officer was asked for a report before the regional officer's own report was sent in.

*Pregnancy.*—An investigation by the organising medical secretary for London has shown that the practice of approved societies in dealing with claims for sickness benefit from pregnant women varies to an extraordinary degree. Some allow no sickness benefit whatever (in uncomplicated cases); others permit six weeks prenatal benefit. One society raises no objection if the patient is considered incapable by reason of pregnancy at the end of the eighth month; another urges that sickness benefit should be commuted and a substantial benefit substituted. The latest figures for this society, which refers every case of pregnancy, show that seven out of every ten certified as pregnant are found capable of work. There remains also to be considered the question whether such a woman is capable of doing "housework." A subcommittee was appointed to consider this subject and report in November. There was a suggestion, too, that a conference should be arranged with approved societies to try to make some agreed arrangement.

*Public Medical Services.*—An application for the loan of £1000 from the National Health Defence Trust to further publicity for the London Public Medical Service was considered. The service, it was stated, is steadily growing; there are about 17,000 subscribers and between 700 and 800 doctors; and it is run in conformity with the model scheme. It was decided to ascertain more exactly the British Medical Association's attitude to loans for public medical services.

The question of publicity for medical services was considered at the Representative Meeting in Dublin, where it was agreed that where necessary the Association should advance money to help in launching them. A difficulty of the same kind has arisen in Birmingham, where a scheme for a public medical service was launched a few months ago. The scheme is said to be hampered by that phase of the medical code which discourages anything that may be regarded as advertising, and it is said that few of those who should profit by it know of its existence. The slogan of the service is "Ask your own doctor," and so far some 250 practitioners in Birmingham have joined it—most of them practising in the industrial area of the city.

A similar scheme for middle-class people is likely to be started next month in the Manchester area, the proposed charges covering the benefits being 36*s*.

per year for single persons, 46s. for married couples, and 56s. for married couples with one or more dependants under 16. Here the advice given is to be "Choose your own doctor and specialist and your own institution"; from which it will be gathered that the intention is to include every sort of service, whether at home, in the consulting-room, or in hospital.

# CORRESPONDENCE

## SHOCK-PROOF X RAY INSTALLATIONS

*To the Editor of* THE LANCET

SIR,—In a leading article in the current number of THE LANCET you have stressed the two most important points in the avoidance of X ray fatalities, notably (1) the personal factor and (2) the urgent need for the greater use of shock-proof apparatus.

As the golfer aims at his swing becoming automatic, the expert radiologist and his good technical assistant, the radiographer, have the same objective. The final glance by the expert, when all is ready for his work, is automatic, but nevertheless of vital importance. It would be impossible, however, for the radiologist in a busy hospital to be present at every X ray examination in the wards, and it was this fact among others which led some of us long ago to found the Society of Radiographers. The excellent work of members of this society have more than justified the venture. While their training naturally does not justify them in treading the thorny ground of diagnosis, they are expert in the technical side of the work, and the relationship between them and the radiologist is a very happy one.

As you say, the ideal to be aimed at is the more general use of shock-proof apparatus. British manufacturers have been engaged for some time in investigating the possibilities of making shock-proof (dare I say "fool-proof"?) apparatus. To-day this is obtainable, and it is quite possible to make existing apparatus similarly safe. No wearing of rubber shoes or other things of the kind can obviate the result of contact with the high tension side of the apparatus. Indeed, were I to have to choose, I should prefer to come in contact with high tension leads without wearing rubber soles; in the one case I might have a sporting chance, in the other certainly none.

At the forthcoming annual meeting of the British Institute of Radiology, in December next, I understand that there is to be a special feature in the exhibition of shock-proof apparatus by British manufacturers. It is clear that to-day anyone who is thinking of installing portable apparatus will be wise if he decides upon having it shock-proof.

It is perfectly true that fatalities such as the recent one are of extreme rarity, but the potential danger is always there, and it would be foolish to shut one's eyes to this fact.—I am, Sir, yours faithfully,

London, W., Oct. 2nd, 1933. STANLEY MELVILLE.

## ANGIONEUROTIC ŒDEMA

*To the Editor of* THE LANCET

SIR,—Dr. Lennon's paper in your last issue induces me to mention a case I had about ten years ago.

The patient was a retired medical man, aged 62, and had suffered from angioneurotic œdema since 1916. There was no family history of allergy. He had first swellings of the lips, cheeks, tongue, and uvula. He was vaccinated with *Staphylococcus albus* and *aureus*, and with streptococci, but this did no good. He sometimes developed a carbuncle on his cheek or neck, which was always followed by swellings in the neighbourhood in about seven to nine days. Since the angioneurotic œdema came on he has had acid gastric attacks, lasting from 24 to 36 hours. When he came to me he had been lately suffering from œdema of the tip of the tongue, the heel, and the instep. The œdema lasted from a few hours to 36 hours. I ordered him peptone injections, of which he had 16. This was in May, and from this time until December he was quite free, and thought himself cured. The attacks, however, returned, and subsequent injections did him little good.

He saw me from time to time, with but little change in his symptoms, but last spring he came again saying he had got great relief by taking 3 drachms of sodium citrate. This stopped the attacks, especially if taken on an empty stomach. The œdema always cleared off within an hour. If not, he took a second dose, which almost immediately brought relief. It may be that the acid gastric attack made him think of trying this remedy. I am, Sir, yours faithfully,

Harley-street, W., Sept. 30th, 1933. A. G. AULD.

## KETOGENIC DIET IN URINARY INFECTIONS

*To the Editor of* THE LANCET

SIR,—I have read Drs. Fuller and Colebrook's article in to-day's number of THE LANCET with interest and admiration. One point, the use of fresh lemons for drinks, which they recommend, I should like to mention. If these are used extensively they increase the alkaline excretion in the urine to such an extent as to make even a urine with a heavy ketone excretion definitely alkaline. I was once puzzled by finding a strongly alkaline urine (pH 8·2) in a severe diabetic with a heavy ketone excretion. This was proved to be directly due to fresh lemon drinks. In cases of urinary infections treated by ketogenic diets, not only ketonuria but also a strongly acid urine seem desirable, so that a warning as regards unlimited lemon drinks is not out of place.—I am, Sir, yours faithfully,

R. D. LAWRENCE.

Harley-street, W.1, Sept. 30th, 1933.

## THE INDIAN MEDICAL SERVICE

*To the Editor of* THE LANCET

SIR,—In the Students' Number of THE LANCET, dated August 26th, there appears a "Memorandum regarding appointments to and conditions of Service in His Majesty's Indian Medical Service," issued by the Military Department of the Secretary of State for India. This shows that recruitment for a Service hitherto famed for work in the tropics, and for entry into which keenness in competition was for many years more pronounced than in the Naval and Royal Army Medical Corps Services, is now conducted under the auspices of a selection committee. *Pour encourager les autres*, it has been affirmed that a highly placed medical official has expressed satisfaction with the "material" forthcoming. It is, however, probable that a more judicious view of conditions has been pronounced by Mr. Butler (Under Secretary for India), as reported in THE LANCET of July 22nd, page 214, who "said that there had been lately a definite improvement in the recruiting of Government medical officers so far as numbers were concerned, and on the whole the quality of the candidates had also improved." In the Act of 1924, which amended the Government of India Act of 1919, considerable advances towards self-government in India were made, which do not seem to have found favour with British medical men, as shown by the India Army List for April, 1933; here it is found that the "material"

which gave satisfaction to the medical official was from 1925 to 1931 entirely Asiatic.

The memorandum embodies short service gratuities which may prove tempting to men desirous of capital for purchase of a practice, yet oblivious to the fact that years spent in fighting tropical diseases need not conduce to longevity nor to knowledge of conditions which beset public and family life which, in this country, is essential for securing the confidence of private patients and public bodies. But it may well be that the short-service gratuity has no attraction for the recruit, and that he accepts conditions "for better or worse" until he has earned a pension on retirement. Before, however, making this resolve, it is well the candidate should review changes in officialdom which have taken place in India, and those of a still more undesirable nature contemplated under the White Paper policy of the present Government—*cavendo tutus*. Within 23 years complete Indianisation of the army is projected; within five years one-half of the officers of the police will be Indians. The varied functions of the Indian Civil Service will also be largely handed over to Indians. With the best of goodwill on both sides during coöperation in official life, differences in racial ethics will hereafter demand special circumspection. But granted harmony reigns and the right to pensions has been duly earned, what prospect has the present-day candidate of realising it? None—if the Congress party comes into power by the absurd election method proposed—and, again, none if the callous assertion—amply negatived by official records—made on March 7th, 1932, in the House of Commons by the Secretary of State for India, to the effect that the pensions of the Indian Medical Service and the "Indian Services" generally "are not guaranteed by the British Government" is allowed to stand undisputed.

I am, Sir, yours faithfully,

W. G. KING, C.I.E.,
Colonel, I.M.S. (ret.).

Hendon, Oct. 2nd, 1933.

# MEDICAL NEWS

## HOSPITAL DINNERS

### St. Bartholomew's Hospital

The old students' dinner provided the occasion for the inauguration of a public appeal for funds for the development of the medical college, to which we draw attention on p. 836.

### St. Thomas's Hospital

Dr. C. R. Box, presiding over the annual dinner on Sept. 29th, said that 200 years ago the governors and officers of the hospital held a dinner at the end of which a collection was taken to defray the expenses of the ensuing year. Sir Arthur Stanley, however, remarked that history was not going to repeat itself on this occasion. The £20,000 given anonymously in 1912 for rebuilding the out-patient department had grown to £53,000 by the time it was needed, and only another £10,000 would be required to complete the work next year. The reconditioning of the ward blocks was also more than half finished, and would cost £30,000. There was no money at all, but the hospital would not be where it was if the governors had ever stopped to think about money. He did not see why this generation, which had borne the burden and the heat of the day, should deny itself anything for the sake of generations yet unborn.—Prof. L. S. Dudgeon, as dean, began his speech with a reference to the loss of "two of the greatest men at St. Thomas's in my time," John Herbert Fisher and Sir Percy Sargent. Passing to the work of the medical school, he said that the year had seen it linked up for the first time with a municipal hospital, namely, Lambeth. The time had come, he thought, when the medical schools should coöperate; if medical education in London was to occupy its proper place it was essential that they should join together in twos or groups. On the death of Sir Percy Sargent, he continued, Mr. B. C. Maybury had been appointed full surgeon and Mr. R. H. Boggon assistant surgeon. Mr. Max Page had accepted the part-time post of director of the surgical unit, with Mr. R. H. O. B. Robinson as deputy director. Dr. H. K. Goadby was now deputy director of the medical unit. In athletics St. Thomas's had won all three events in rowing, the fencing, golf, hockey, tennis, and cricket. In the athletic sports "we failed: Bart.'s won"; but the chief events were won by St. Thomas's. At Association football the hospital was also successful.—Prof. W. Langdon Brown and Mr. W. Girling Ball, dean of St. Bartholomew's, replied for the guests. Mr. Girling Ball said he thought that rivalry in sport was becoming rather tiresome; he preferred "friendly matches" between the schools. He was sure the time had come when Bart.'s and St. Thomas's should join up; certainly they were in more friendly relations than ever before.—Sir Cuthbert Wallace, proposing the chairman's heath, recalled how Dr. Box's steady and persistent work had built up the children's department at the hospital.

### Charing Cross Hospital

The annual dinner was held this year at the Café Royal and was well attended. Dr. William Hunter, who took the chair, proposed the toast of the Hospital and the Medical School, now at the beginning of the centenary year of their foundation. Since he had last presided, he said, the hospital had sustained the loss of such great teachers as Mitchell Bruce, Sir Herbert Waterhouse, and Sir James Galloway, and, during the last year, of Mr. H. S. Clogg. He congratulated Dr. Gordon Holmes on becoming a Fellow of the Royal Society, and mentioned the appointment of Dr. A. B. Rosher to the London County Council. The hospital and school had seemed an ambitious project when Golding founded them, but nearly all the original aims of the dual foundation had now been attained, and he congratulated the staff on the prosperity of both undertakings. Mr. Eric Crooke, the dean of the school, in reply, referred to the little room with the bow window (now a part of the engineers' department of the hospital) in which Huxley used to work, and thought that it would appropriately mark the centenary year of the hospital if a tablet were placed in that room in commemoration of Huxley. When Golding founded the hospital it was unique in having a medical school as an integral part of its system. This year the entry of students to the school had been larger than ever before, and had now reached the maximum number for which accommodation could be found. Mr. E. D. D. Davis, in proposing the toast of the Chairman, told how Dr. Hunter had been responsible for annexing a public passage-way and adding it to the hospital museum. He had also introduced the use of formalin for preserving the natural colours of museum specimens. In the wards, he said, Hunter was a stimulating teacher, but sometimes his eye would light on a case of pernicious anæmia, and hurrying to the bedside he would ask the patient to put out his tongue. "There you have it—there you have the whole history!" he would say, and sink into a reverie; teaching was at an end for the afternoon. His house physicians learned to hide their pernicious anæmia cases behind screens. Hunter also wrote a history of the school and hospital, and had an idea of making the school a part of the University of London. To-day they were on a wave of success, and the small medical school was undoubtedly coming into its own. In response, Dr. Hunter said that Huxley had begun his life's work in the room with the bow window; in the evenings his head, leaning over the microscope, would be silhouetted on the panes, and the window came to be known as "The Sign of the Head and Microscope." Dr. S. Taylor Harris gave a pleasantly intimate entertainment, singing a programme of favourite songs, from which this conservative gathering never allows him to deviate, while he called Mr. John Goss to complete an old and ever amusing alliance.

## St. Mary's Hospital

The dinner at the Trocadero Restaurant on Sept. 30th, under the chairmanship of Dr. Reginald Miller, was something of a gala. It was held on Saturday evening in the middle of a popular post-graduate course. A novelty was the proposal of the chairman as the first toast after the loyal toasts had been honoured. It gave Dr. P. Montague Smith the opportunity for reminiscences of 22 years ago, when he found evidence that many of his fellow members of the school had mistaken their vocation. He was very willing to admit that Dr. Reginald Miller, who on Caley's retirement in 1911 was promoted from supernumerary to full physician, was following in the tradition of Poynton, Carey Coombs, and David Lees. Dr. Miller, after a graceful and humorous acknowledgment of his own reception, welcomed the guests of the evening, the Vice-Chancellor of London University and the Mayor of Paddington; they were always glad to have with them Colonel H. E. Verey, chairman of the hospital board. Reminding his hearers that there is something that makes for happiness on Saturday nights, he added that to the present-day student in the new school, with its swimming bath and squash court, all days might seem like Saturdays. He concluded with a tribute to the new school as almost a "one-man show," for it owed to Dr. C. M. Wilson the inspiration of its conception, the drive and grit to see it through, and an invincible faith in its future. Dr. Wilson remarked that the completion of the school made it unnecessary for him to deliver the speech which he had already made 13 times, and the freedom allowed him also to be reminiscent. He had held office for 13 years, which had seen great changes. The entry in those early years after the war had been in the thirties. This year 90 students had been accepted, while a considerable number who would have been taken in the ordinary course of events had been reluctantly refused admission. The school was watching and would continue to watch very carefully the relation of the number of students to the number of beds in the hospital. The financial position of the school had been transformed. A sum of nearly a quarter of a million pounds had been spent on the buildings without infringing on the sound financial position of the school. St. Mary's had for more than a decade led the way in branching out into new ventures. In particular he instanced the affiliation with the Paddington Hospital many years before the London County Council took over the infirmaries, and the post-graduate course which attracted every year an average attendance of 200. The new buildings would be formally opened in the near future.

## Westminster Hospital Dinner

Mr. Eric Worsley Gandy presided at a dinner of past and present students of Westminster Hospital, held at Grosvenor House on Sept. 30th. After the health of His Majesty the King had been honoured the chairman related the events of the past year. The school was within three months of its centenary, and now had 128 students. Examination results had been up to a good standard, and an outstanding feature was the school's success in reaching the Rugby Cup semi-finals. The financial position of the hospital had considerably improved by an unexpected legacy of £30,000. In the last 20 years the annual number of in-patients had nearly doubled, and the number of out-patients had increased from 60,577 in the former year to 139,000. He quoted Sir Cooper Perry as having said, when acting as a member of a deputation of the King Edward's Fund, that he knew of no hospital that had made more progress in ten years. All rumours of an amalgamation with St. George's Hospital were, said Mr. Gandy, absolutely unfounded. He described eloquently the new buildings transforming the district round Horseferry-road, and affirmed the autonomy and stability of the Westminster Hospital.

Dr. A. E. Parker, in brief reply, said that his first lesson on arriving at the hospital was to cultivate the art of patience, and his first impression was the smell of cooking and iodoform, then prevalent but now extinct, but he regretted the passing of the old and very unreliable hydraulic lift. A bright future, he said, lay before the hospital.

Mr. J. B. Neal, also in reply, suggested that the hospital had grown—alarmingly. Every day dressers were turned out of the surgery to make room for patients. War had been blamed for many things, but one of its traces on the hospital had gone—the last woman student had qualified. Medical instruction had been superseded by medical education; clinical demonstrations were to be given all the time, replacing an imaginary text-book in the hands of the lecturer.

Dr. Adolphe Abrahams, proposing the health of the visitors, said that the proposer ought to be allowed to select his own visitors: the result would be interesting. He envied the posts of the medical editors present, but failing their jobs he could do very well, he said, with the *Times*. Sir Squire Sprigge perhaps had a disappointment: that he had not the speaker's position of physician to out-patients at the Westminster. Dr. N. G. Horner was not the kind of person whom the editor of the *British Medical Journal* should look like—fierce, with beetling brows—but he could forge the anchor as well as spin the gossamer. He had been the second best editor that the *Journal* of St. Bartholomew's Hospital had ever had—he would not mention the name of the best.

Sir Squire Sprigge interpreted his invitation and that of Dr. Horner as a generous recognition of the inexactly defined position of medical journalism as an integral part of the profession. One of a medical editor's problems nowadays was, he said, to understand the actions and reactions which determined the attitude of the public to the profession. The public was apt to assume that the doctor was too learned to attend to common sense, and that if laymen had control of the nation's health things would go better. It was unthinkable that those who had been intensively educated in the essentials of medicine should be superseded by excited laymen, but this sometimes seemed to be a danger. The work of a medical editor was like that of a ringmaster in a circus; he did not perform himself but chose the performers, and to some extent controlled their tricks. His most pleasant duty was coöperation with the men in all branches of the profession, without whose constant help and advice the journal could not be conducted.

Dr. N. G. Horner said that he had many friends present and was not a stranger where he was a guest. Immediately on qualification he had become a member of the resident staff, and looked back on many happy memories. He had also a prenatal connexion, as his father had been resident obstetric officer.

Mr. Arthur Evans proposed the health of the chairman, giving a humorous description of modern anæsthetic practice when the chairman, in reply, bade farewell to old friends upon his imminent resignation from the board of the hospital, but pointed out other directions in which his connexion with them would be maintained.

## St. George's Hospital

The annual dinner of the School took place at Claridge's Hotel, Brook-street, on Monday, Oct. 2nd, when a large gathering was presided over by Dr. Henry Robinson, J.P., L.C.C., who was supported by many members of the school and hospital staff. The toast of "The King" having been pledged, the chairman, in submitting that of the Hospital and Medical School, said the present had been a special year because of the celebration of the bicentenary, in honour of which a very enjoyable gathering took place in the summer. Of the question which had been agitating so many minds lately—that of the removal of the hospital from Hyde Park Corner and its rebuilding on another site—he would say that it was a burning one even in the day when he was actively connected with the medical school, for then all kinds of plans were drawn up, and even a water-colour drawing of a proposed new elevation was executed; now, he added, the outworn condition of the building rendered the situation even more urgent, one indeed that must be practically tackled. The medical school, he was able to report, was in a flourishing condition, maintaining its fine traditions, while Dr. J. Blomfield's book on the institution should be read, for its historic interest, by all St. George's men. He would refer, he said, to a very interesting account in its pages of the epidemic of cholera which visited London in the 'fifties, when a large number of cases were received into

the hospital, and towards the end of the epidemic Dr. Reginald Thompson, the registrar, caught the disease. Thompson assiduously took note of all his own symptoms and his progress, and out of his experience predicted the day of his crisis correctly and recovered. Dr. Robinson closed with a sympathetic reference to the late Sir William Bennett, under whom he had served. Bennett, he said, seldom seemed to take his house surgeons into his confidence, but on one occasion, after an illness of several weeks, he received visits during his convalescence, and revealed a warm and confidential side of his character. During these visits he detailed many episodes in his busy career, one of which might be related because of its moral. Sir William, he said, was one of the earliest of the enthusiastic converts to Listerism, and it fell to his lot to practise excision of a tuberculous elbow for a scion of the aristocracy. Bennett plumed himself on the fact that as this operation had then only been done by a few people the event would do him a lot of good, especially as he was certain he would avoid suppuration. But, to his horror, the wound suppurated profusely for weeks, and the surgeon concluded that this would seriously damage his private practice and even career. After some weeks of daily dressings the child convalesced, and eventually made a satisfactory recovery. Then he found that the influential parents had been saying most gratifying things about him, such as that it was surprising what an anount of corruption was discovered in the boy's system, and what a good thing it had now been eradicated, and how great the surgeon was. The moral, the speaker declared, was that a doctor often got credit to which he was not entitled, and blamed where praise was his due.

Dr. Anthony Feiling, dean, responding, said that in view of the present world depression this was not a favourable time to appeal to the general public for a large sum of money, and that accounted for the fact that the bicentenary celebration had been a domestic one. A fund, however, was inaugurated, and a wireless appeal made, and resulted in the collection of £5000; St. George's men subscribed £565, and nurses of the hospital £380, while the proceeds of the sale of Dr. Blomfield's book were being given to the fund. The work of the medical school had been continued successfully, and students had carried off several big prizes. A post-graduate course had been instituted for old students of the hospital, largely as the result of a stimulating address given by Dr. Le Fleming; some 30 practitioners were attending, and it was a course full of promise. The entry of students for the current session was entirely satisfactory. Speaking on the removal of the hospital to another site, he emphasised the great need for this as soon as times were better; on the present site it was impossible to expand, and even contraction might set in, and, moreover, the hospital buildings were not in too good a condition. To a new member of the staff, Mr. M. F. Nicholls, he extended a warm welcome, and concluded with congratulations to Sir Stewart Duke-Elder on his knighthood.

Mr. M. I. A. Hunter having also responded, the toast of "The Chairman" was submitted by Mr. Claude Frankau, who referred to the many activities of Dr. Robinson, his services in the South African war and the European war, and his devotion to public affairs. The chairman briefly responded.

### Middlesex Hospital

In describing the remarkable development of the hospital during recent years, Dr. Henry MacCormac, chairman at the annual dinner, said that Mr. W. H. Collins had lately given £25,000 for a new department of radio-diagnosis. This is to be in charge of Dr. H. K. Graham Hodgson, who was present as a guest. When it was built, Dr. MacCormac said, the hospital was the smallest in London; before the war it was eighth; now it was third. This meant progress; but it was, he thought, the tradition of service that bound Middlesex men together.—Mr. S. A. Courtauld, chairman of the medical school council, expressed the great satisfaction of the council at the reputation, national and international, which the various institutes of the hospital are achieving.—Dr. Izod Bennett, the dean, said that last year the school had had a record entry of 68 new students; this year it was 90—partly perhaps because the depression had led business men to put their sons into "that most lucrative profession of which we are members." He believed that the work being done in some of the laboratories was soon going to produce something very wonderful indeed.—Dr. H. G. Bywaters, senior Broderip scholar, said that the medical student now had no time to grouse: "the rate is so rapid that murmurs cannot be heard." The authorities insistently encouraged katabolism rather than anabolism; this was reflected, for instance, in the fact that 1*d*. was charged for sitting at tables in the restaurant but nothing at all for sitting in the little cubicles downstairs.—Mr. A. E. Webb-Johnson, treasurer of the medical school, in a speech of graceful references to the guests, spoke of Sir Holburt Waring's persistent endeavour to make Bart.'s not only the oldest but the best hospital in London. "We at Middlesex know that he is attempting the impossible, but we admire the attempt." Sir Holburt, in his reply, looked forward to the time when the athletic representatives of London University schools would join together and compete, as conquerors, with other university teams. He thought it useless to try to reserve paying beds in the new wing "for the middle-classes" alone—they must be available for every class—and he hoped the new radiological department would include a department of biophysics.—Mr. Collins said that his gift was a token of gratitude for surgical help he had received, and if more money was needed to make it the best of its kind he would be there to foot the bill.—Dr. G. E. Beaumont was very amusing about the chairman, and Dr. MacCormac's health was drunk with enthusiasm.

The dinner was held at the Savoy Hotel on Tuesday evening.

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### Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the Faculty, held on Oct. 2nd, the following were admitted to the Fellowship:—

John William Stewart Blacklock, M.D., John Fulton Christie, M.B., Eric Gustav Gerstenberg, M.B., and William Steele Watson Guthrie, M.B. (Glasgow); John Alfred Allen Hunter, L.R.C.P. (Llanelly); Archibald Brown Kerr, M.B., and Frank Thomas Land, M.B. (Glasgow); and Ian Bowman Thorburn, M.B. (Hamilton).

### Gresham College

Four lectures on the English hospital system will be delivered by Sir George Newman, chief medical officer to the Ministry of Health, at 6 P.M., from Monday, Oct. 9th, to Thursday, Oct. 12th, at Gresham College, Basinghall-street, London, E.C. 2.

### Society of Medical Officers of Health

The annual general meeting of this society will be held at the house of the society, 1, Upper Montague-street, Russell-square, London, W.C., on Friday, Oct. 20th, at 5 P.M. Dr. Charles Porter will be installed as president of the society, and the subject of his presidential address will be "Presidents and Prophecies." The annual dinner of the society will be held at the Mayfair Hotel, Berkeley-street, London, W., on Thursday, Nov. 23rd, at 7.30 P.M. H.R.H. Princess Louise and Sir Hilton Young, Minister of Health, will be the guests of the evening. Further particulars may be had from the executive secretary of the society.

### Fellowship of Medicine and Post-Graduate Medical Association

There will be an all-day course in cardiology for advanced students at the National Hospital for Diseases of the Heart, from Oct. 9th–21st. A week-end course in clinical surgery will be given at the Royal Albert Dock Hospital on Saturday and Sunday, Oct. 21st and 22nd. The course will occupy the whole of each day from 9.30 A.M. to 6.30 P.M. Forthcoming courses include a course in gynæcology at the Chelsea Hospital, Oct. 23rd to Nov. 4th; a course in neurology at the West End Hospital for Nervous Diseases; a week-end course in diseases of the chest at the Hospital for Consumption, Brompton; a course in ophthalmology at the Central London Ophthalmic Hospital; and a course in urology at St. Peter's Hospital for Stone. A panel of teachers giving clinic instruction is available throughout the year, and courses may be arranged for members and associates by the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

### University of London

*Heath Clark Lectures.*—At the London School of Hygiene and Tropical Medicine, Gower-street, London, W.C., on Wednesdays from Oct. 18th to Nov. 15th, at 5 P.M., Mr. Cyril Burt, D.Sc., professor of psychology in the University, will deliver a course of five lectures on the normal and subnormal mind, some contributions of modern psychology to problems of social medicine. The chair will be taken at the first lecture by Dr. C. S. Myers, principal of the National Institute of Industrial Psychology. No ticket of admission to the lectures is necessary.

### University of Durham

The inaugural address of the winter session at the University of Durham College of Medicine, Newcastle-upon-Tyne, will be given on Friday, Oct. 13th, at 4.15 P.M., by Sir Norman Walker, president of the General Medical Council.

### University of Bristol

The Long Fox memorial lecture will be delivered by Mr. Cecil A. Joll on Tuesday, Nov. 7th, in the physiological lecture theatre of the University, at 5.30 P.M. Mr. Joll's subject will be recent advances in the ætiology, diagnosis, and treatment of cancer. The vice-chancellor will preside.

### The Psychology of War

A lunch-hour address on War, Sadism, and Pacifism will be given by Dr. Edward Glover at 1.20 P.M. on Tuesday next, Oct. 10th, at Friends House, Euston-road, London, N.W. Dr. Glover's book on this subject was reviewed in our issue of July 22nd.

### British Institute of Philosophy

The next meeting of this institute will be held at University College, Gower-street, London, W.C., on Tuesday, Oct. 17th, at 8.15 P.M., when Prof. E. A. Milne, Rouse Ball professor of mathematics in the University of Oxford, will speak on some points in the philosophy of physics, time, evolution, and creation. Tickets may be had from the director of studies at University Hall, 14, Gordon-square, London, W.C. 1.

### Grocers' Company Scholarships

The next election for the scholarships which the Grocers' Company offers with the object of encouraging original research in sanitary science will take place in May, 1934. Each scholarship is worth £300 per annum, and an allowance is given for apparatus and other expenses in connexion with the work. The scholarships are tenable for one year, but are renewable for a second or third year. Applications must be sent before the end of April, 1934, to the clerk to the Company, Grocers' Hall, London, E.C.2.

### Mental Treatment Act, 1930

Those medical practitioners whose approval for the purpose of signing recommendations under Sections 1 (3) and 5 (3) of the Mental Treatment Act, 1930, expires on Dec. 31st next, are being invited by the Board of Control to make application for renewal of the approval, and are being furnished with forms of application for this purpose. Any other practitioner who may desire to seek approval under the Mental Treatment Act can obtain a form of application on writing to the Board of Control, Caxton House West, Tothill-street, Westminster, S.W. 1.

### Chadwick Lectures

The autumn programme of the Chadwick Trust opens with a lecture on the Port of London sanitary administration by Mr. P. W. Coombe at the house of the Royal Society of Arts, John-street, Adelphi, at 5.15 P.M., on Monday, Oct. 23rd. Dr. Percy Flemming will give the second lecture, which will range from the sanitary arrangements of the present day to those of mediæval monasteries. This will be delivered on Thursday, Nov. 2nd, at 26, Portland-place, London, W. The Malcolm Morris memorial lecture will be given on Nov. 14th by Dr. R. O. Moon, whose subject is housing and town planning in relation to public health. Other arrangements include a symposium on the one-pipe system of house drainage in theory and practice, and an address by Mr. J. H. Coste, F.I.C., on rural sanitation. Particulars may be had from the secretary of the Trust at 204, Abbey House, Westminster, S.W.

### Surgical Instruments Manufacturers' Association

The annual dinner of this association will be held at the Criterion Restaurant, Piccadilly-circus, London, W. on Friday, Oct. 20th. The principal guest will be Sir William Wheeler.

### London Hospital Medical College

On Thursday, Oct. 12th, at 4.30 P.M., Dr. Otto Leyton, physician to the London Hospital, will deliver the Schorstein memorial lecture in the anatomical theatre of the hospital. His subject will be Multiglandular Disease. The annual dinner will be held at the Trocadero Restaurant at 7.30 for 8 P.M. on the same day.

### International Exhibition of Inventions

This exhibition is now being held at the Central Hall, Westminster, London, S.W., and will remain open until Oct. 14th.

### Health Education Visits

The Socialist Workers' National Health Council has organised a series of visits to health institutions in and around London. The parties are conducted by Dr. F. G. Bushnell, late medical officer for Essex and Plymouth, and their object is "to familiarise workers with existing institutions and their management, and to press home the need for the socialisation of the health services." The visits are made on Wednesday afternoons, and will continue until Dec. 13th. There is also a lecture given at each institution on an appropriate subject, and the speakers include Dr. W. S. C. Copeman, Mr. R. Y. Paton, and Dr. Helen M. Jardine. The next institution to be visited is the Lewisham Hospital ("a rate-supported L.C.C. hospital") on Oct. 11th. Further particulars may be had from Dr. Bushnell at Nutley Cottage, Mimbridge, Woking.

CORRIGENDUM.—In the course on the preventive aspect of disease at King's College Hospital, the lecture on Jan. 25th on the control and prevention of infectious diseases will be by Dr. R. A. O'Brien, and not as stated in our issue of Sept. 23rd.

## OBITUARY

### ROBERT MORRISON, L.R.C.P. Edin.

Dr. Morrison, of Duffield, who died on August 29th, at the age of 74, was one of a fast disappearing type—the hunting doctor. He came of Ulster presbyterian stock, the son of James Morrison, of Toberdoney, Dervock, Co. Antrim, and was educated at Queen's College, Belfast, and Queen's College, Galway, and the Royal Colleges at Edinburgh, taking the old "triple qual" in 1885. All his life he was a friend of horses and dogs, and when he came to settle down in practice, the open-air life of a country doctor, before the days of motors, appealed to him irresistibly. Accordingly he settled in Duffield, a village on the edge of the Derbyshire hills, 42 years ago, and soon acquired an extensive practice—his sound technical knowledge and great kindliness appealing to every class of the community. In his younger days he was an admirable tennis player, good golfer, and excellent shot—but hunting was his real joy. He was thus a well-known figure for over 30 years with the Meynell and Harrington hunts; and whenever there was an accident in the field the first cry was "Where's Morrison?" He did not neglect his patients for his sport, but when hounds were anywhere in the neighbourhood, and he had no anxious cases on hand, he joined the hunt.

For many years he was medical officer to the Belper R.D.C., and held in addition many local appointments, while during the war he was M.O. to the Duffield V.A.D. Hospital. He married Mildred, only daughter of Mr. Alfred Pochin, of Leicester, and had three children, one of whom, Dr. Gordon Morrison succeeds him in practice. His widow and children survive him.

# Medical Diary

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 9th.—4.30 P.M., UNITED SERVICES: Surg.-Capt. H. E. R. Stephens: The Influence of Wars on the Craft of Surgery. (Presidential address.)

TUESDAY.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Dr. J. H. Burn: A Pharmacological Approach to the Cause of Asthma. (Presidential address.)

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Dr. F. Parkes Weber: 1. Gout in the Hands of a Woman aged 22. 2. Erythræmia with Great Excess of Uric Acid in the Blood. Dr. E. Stolkind: 3. Erythro-leukæmia (polycythæmia rubra vera "Vaquez Disease") associated with Leukæmia. Miss G. Barry: 4. Spina Bifida Occulta and Trophic Changes in the Legs in a Girl aged 25. Other cases will be shown.—8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers: Dr. H. Semon and Mr. Eugene Wolff: Lupus Erythematosus with Fundus Lesions. Mr. Eugene Wolff: Normal Medullation of the Optic Nerve-head in the Dog.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Oct. 9th.—8.30 P.M., Sir John Thomson-Walker: Surgery in the Early Nineteenth Century. (Presidential address.)

HARVEIAN SOCIETY OF LONDON.

THURSDAY, Oct. 12th.—4.30 P.M. (at the Royal Veterinary College, Great College-street, N.W), a Clinical Meeting.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Oct. 10th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Dr. G. H. Oriel and Dr. Millais Culpin: Asthma.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY, Oct. 12th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. J. C. Young: Individual Psychology and Holistic Medicine.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, Oct. 10th.—4 P.M. (at 11, Chandos-street Cavendish-square, W.), Dr. A. E. A. Carver: Paraldehyde Addiction.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, Holloway-road, N.

WEDNESDAY, Oct. 11th.—8.45 P.M., Dr. R. A. Young: Empyema Thoracis: its Diagnosis and Management.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF LONDON.

MONDAY, Oct. 9th.—5 P.M. (at University College, Gower-street, W.C.), Dr. R. J. Lythgoe: Physiology of the Sense Organs. (First of six lectures.)

TUESDAY.—5 P.M. (at King's College, Strand, W.C.), Mr. J. W. Pickering, D.Sc.: Blood Plasma and Platelets. (First of four lectures.)

THURSDAY.—5 P.M. (at King's College, Strand, W.C.), Mr. W. Robson, D.Sc.: Metabolism of Carbohydrates, Fats, and Proteins. (First of four lectures.)

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

THURSDAY, Oct. 12th.—10 A.M., Dr. W. N. Goldsmith: Fungous Diseases of the Skin. 10.45 A.M., Dr. C. Bolton: Ward Demonstration of Patients suffering from Gastric Diseases. 11.30 A.M., Dr. F. M. R. Walshe: Some Problems in the Treatment of Nervous Diseases. 12.15 P.M., Sir Thomas Lewis: Ward Demonstration of Patients suffering from Cardiovascular Diseases. 12.15 P.M., Mr. A. J. Gardham: Conservative Methods in Modern Surgery. 2 P.M., Dr. F. J. Poynton: The Treatment of Rheumatoid Arthritis. 2 P.M., Mr. Watkyn-Thomas: Demonstration of Ward Cases. 2.45 P.M., Mr. Humphrey Neame: The Differential Diagnosis of Conjunctivitis and Iritis, and their Treatment. 3.30 P.M., Dr. W. J. Pearson: Management of the Premature Child.

FRIDAY.—10 A.M., Mr. Gwynne Williams: Fractures of the Neck of the Femur. 11 A.M., Dr. H. P. Himsworth: The Management of Diabetes on High Carbohydrate Diets. 11.45 A.M., Prof. H. A. Harris: The Technique of Radiography of the Chest. 12.45 P.M., Dr. M. Maizels: Stools in Infancy. 2 P.M., Dr. Kenneth E. Harris: The Investigation and Treatment of Increased Venous Pressure in Congestive Heart Failure. 2 P.M., Mr. C. W. Flemming: Colles's Fracture. 2.45 P.M., Dr. J. W. McNee: The Classification and Treatment of the Anæmias. 3.30 P.M., Prof. F. J. Browne: The Toxæmias of Pregnancy. (This course is open only to graduates and students of the school.)

LONDON HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

WEDNESDAY, Oct. 11th.—10 A.M., Dr. Maitland-Jones: Some Peculiarities of Disease in the Child. 11 A.M., Mr. Keizer: Teeth in General Practice (clinical demonstration). 12 noon, Dr. Panton: Coliform Infection of the Urinary Tract. 1.30 P.M., Mr. Donald: Sepsis (clinical demonstration). 2.30 P.M., Dr. Horace Evans: Nephritis (clinical demonstration). 3.30 P.M., Dr. Russell Brain: Herpes Zoster. 2 P.M., Mr. Lindsay Surgical Operation. 4.15 P.M., Mr. Marrack: Simple Chemical Tests.

THURSDAY.—10 A.M., Mr. Muecke: Everyday Helps. 10.45 A.M., Mr. Goulden: Minor Injuries to Eye. 11.30 A.M., Dr. O'Donovan: Dermatitis and Compensation. 12 noon, Dr. Hunter: Obesity. 1.30 P.M., Mr. Brews and Mr. Lack: Gynæcological Demonstration. 2.15 P.M., Prof. Ellis: Treatment of Nephritis. 3.15 P.M., Dr. Parkinson: Heart Failure. 4.30 P.M., Dr. Leyton: Multiglandular Disease (Schorstein lecture).

FRIDAY.—10 A.M., Mr. Milne: Low Back Pain. 11 A.M., Mr. Holland: Birth Control. 11 A.M., Mr. Patterson: Demonstration of cases. 12 noon, Dr. Riddoch: Headaches. 1.30 P.M., Dr. Bedson: Serum Prophylaxis of Virus Diseases. 2 P.M., Dr. Wall: Medical Complications of Pregnancy. 3 P.M., Dr. Vilvandré: Radiological Survey. 3.45 P.M., Dr. Hutchison: Chronic Intussusception. 4.30 P.M., Mr. Dix: The Non-operative Treatment of Minor Degrees of Prostatic Obstruction.

SATURDAY.—10 A.M., Dr. Tallerman: Colic and Vomiting in Early Infancy. 11 A.M., Mr. Howard: Clinical Demonstration. 12 noon, Mr. Walton: The Surgery of the Gall-bladder. (This course is open only to graduates and students of the school.)

FELLOWSHIP OF MEDICINE AND POST GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.1.

MONDAY, Oct. 9th, to SATURDAY, Oct. 14th.—METROPOLITAN HOSPITAL, Kingsland-road, E. Post-graduate Course in Medicine and Surgery and the Specialties, occupying the whole of each day.—ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. Afternoon Course in Dermatology. Clinical instruction daily and lectures twice a week.—LONDON CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W. Evening Course of Lecture-demonstrations on Physical Medicine.—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. Post-graduate Course, for advanced students, in Cardiology, occupying the whole of each day.—PANEL OF TEACHERS. Individual clinics are available daily by special arrangement with the Fellowship of Medicine.—Courses, &c., are open only to Members and Associates of the Fellowship.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Oct. 9th.—10 A.M., Medical Wards; 11 A.M., Surgical Wards, Skin Clinic; 2 P.M., Surgical and Gynæcological Wards; 2 P.M., Eye and Gynæcological Clinics; 4.15 P.M., Lecture, Mr. Roche: Hæmaturia.

TUESDAY.—10 A.M., Medical Wards; 11 A.M., Surgical Wards; 2 P.M., Throat Clinic; 4.15 P.M., Lecture, Mr. Green-Armytage: Abortion.

WEDNESDAY.—10 A.M., Medical and Children's Wards, Children's Clinic; 2 P.M., Eye Clinic; 3.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M., Neurological Clinic; 11.30 A.M., Fracture Clinic; 2 P.M., Eye and Genito-urinary Clinics; 4.15 P.M., Lecture, Mr. Woodd Walker: Surgery of Foot and Ankle.

FRIDAY.—10 A.M., Skin Clinic; 12 noon, Lecture on Treatment; 2 P.M., Throat Clinic; 4.15 P.M., Lecture, Dr. Redvers Ironside: Diagnosis and Treatment of G.P.I.

SATURDAY.—10 A.M., Medical and Surgical Wards, Children's and Surgical Clinics.

DAILY.—2 P.M., Operations, Medical and Surgical Clinics. The Lectures at 4.15 P.M. are open to all Medical Practitioners without fee.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Oct. 9th, to SATURDAY, Oct. 14th.—Intensive Post-graduate Course daily. (Second week.)

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Oct. 11th.—4.30 P.M., Mr. W. K. Irwin: Diagnosis and Treatment of Some Important Bladder Conditions.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Oct. 9th.—3.30 P.M., Dr. Gordon Holmes: The Sensory System.

TUESDAY.—3.30 P.M., Dr. Carmichael: The Physiology of the Cerebro-spinal Fluid.

WEDNESDAY.—3.30 P.M., Dr. Collier: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Riddoch: The Cranial Nerves and Special Senses.

FRIDAY.—3.30 P.M., Dr. Bernard Hart: The Psychoneuroses.

Out-patient clinic each day at 2 P.M.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Chandos-street, W.C.

SUNDAY, Oct. 8th.—10.30 A.M., Mr. E. D. D. Davis: Prevention and Treatment of Acute Infective Catarrh, or so-called Influenza. 11.45 A.M., Dr. K. Shirley Smith: Syphilis of the Heart.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Oct. 12th.—4.30 P.M., Sir Leonard Hill: Ventilation, Sunshine, and Clothing. 9 P.M., Mr. A. Edmunds: Deformities of External Genitalia.

GRESHAM COLLEGE, Basinghall-street, London, E.C.

MONDAY, Oct. 9th, to Thursday, Oct. 12th.—Daily at 2 P.M., Sir George Newman: The English Hospital System.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.
TUESDAY, Oct. 10th.—5 P.M., Dr. W. N. Goldsmith: Anatomy and Physiology of the Skin.
THURSDAY.—5 P.M., Dr. G. B. Dowling: Mycotic Diseases.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, Oct. 11th.—3.30 P.M., Dr. J. B. Alexander: Diet in Diabetes.

ROYAL INSTITUTE OF PUBLIC HEALTH, 23, Queen-square, W.C.
MONDAY, Oct. 9th, and following TUESDAY and WEDNESDAY.—4 P.M., Prof. J. C. Drummond, D.Sc.: Modern Views of the Vitamins and their Functions. (Harben Lectures.)

LEEDS GENERAL INFIRMARY.
TUESDAY, Oct. 10th.—4 P.M., Prof. G. W. Watson: Alimentary Disorders.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Oct. 10th.—4.15 P.M., Dr. F. R. Ferguson: The Differential Diagnosis and Treatment of Headache.
FRIDAY.—4.15 P.M., Mr. E. D. Telford: Demonstration of Surgical Cases.

## Appointments

FENTON, M. J., M.B., Ch.B. Sheffield, has been appointed Physician in Charge of Skin Department, Battersea General Hospital.

YOUNG, J. BRUCE, M.D. Edin., M.R.C.P. Lond., Hon. Physician to the Connaught Hospital, Walthamstow.

Certifying Surgeons under the Factory and Workshop Acts:—CAMPBELL, F., M.D., B.Ch. Belf. (Malvern); MORRIS, G. C., L.R.C.P. Lond., M.R.C.S. (Eskdale, Cumberland).

## Vacancies

***For further information refer to the advertisement columns***

*Barnsley, Beckett Hospital and Dispensary.*—Res. Surg. O. £300.
*Belgrave Hospital for Children, Clapham-road, S.W.*—H.P. and H.S. Each at rate of £100.
*Birmingham, Dudley-road Hospital.*—Jun. M.O.'s. Each at rate of £200.
*Bolingbroke Hospital, Wandsworth Common, S.W.*—Hon. Surg. to Ear, Nose, and Throat Dept.
*Bradford Royal Eye and Ear Hospital.*—Jun. H.S. £150.
*Bristol University.*—Lectureship in Physiology. £400.
*Burnley, Victoria Hospital.*—H.P. At rate of £150.
*Cambridge, Addenbrooke's Hospital.*—H.P. At rate of £130.
*Cancer Hospital, Fulham-road, S.W.*—Asst. Radium Officer. £250.
*Chesterfield and North Derbyshire Royal Hospital.*—H.S. At rate of £150.
*City of London Hospital for Diseases of the Heart and Lungs, Victoria-park, E.*—H.P. At rate of £100.
*Croydon Mental Hospital, Upper Warlingham.*—Third Asst. M.O. £350.
*Croydon County Borough.*—Asst. School M.O.H. and Asst. School M.O. £500.
*Devon County Council.*—Asst. County M.O. £500.
*Dorchester, Dorset County Hospital.*—H.S. At rate of £160.
*Eastbourne, Princess Alice Memorial Hospital.*—Res. H.S. At rate of £150.
*Evelina Hospital for Sick Children, Southwark Bridge-road, S.E.*—Hon. Dental Surgeon.
*Glasgow Eye Infirmary.*—Res. H.S. and Res. Asst. H.S. Each £100. Also Clin. Asst. £30.
*Grocers' Company, Grocers' Hall, E.C.*—Research Scholarships. Each £300.
*Halifax Royal Infirmary.*—Res. Surg. O. Also 3rd H.S. At rate of £250 and £150 respectively.
*Hampstead General and North-West London Hospital, Haverstock-hill, N.W.*—H.S. At rate of £100.
*Hospital for Epilepsy and Paralysis, Maida Vale, W.*—Two Hon. Asst. Surgeons. Also Res. M.O. and H.P. At rate of £150 and £100 respectively.
*Infants Hospital, Vincent-square, Westminster.*—Clin. Asst. Also Clin. Asst. to Radiological Dept.
*Leeds University.*—Research Fellow. £500.
*Leicester Royal Infirmary.*—Visiting Anæsthetists.
*Lewisham Hospital, High-street, Lewisham, S.E.*—Asst. M.O. £350.
*Liverpool, David Lewis Northern Hospital.*—Cas. O. At rate of £120.
*London Homœopathic Hospital, Great Ormond-street, W.C.*—Res. M.O. £100.
*London Hospital, E.*—Hon. Asst. Physician to Skin Dept.
*Maidstone, Kent County Ophthalmic and Aural Hospital.*—H.S. to Ear, Nose and Throat Dept. At rate of £200.
*Manchester, Ancoats Hospital.*—Res. M.O. At rate of £150.
*Manchester Ear Hospital, Grosvenor-square, All Saints.*—Res. H.S. £120.
*Manchester Royal Eye Hospital.*—Jun. H.S. £120.
*Manchester, Whitworth St. West Hospital, &c.*—Two H.S.'s. Each at rate of £50.
*Metropolitan Hospital, Kingsland-road, E.*—Sen. and Jun. H.S.'s. Also Cas. O. Each at rate of £100.
*Middlesbrough, North Riding Infirmary.*—Third H.S. At rate of £125.
*North Middlesex County Hosp., Edmonton.*—Medical Officer. £750.
*Northwood, Mount Vernon Hospital.*—Asst. Radiologist.
*Nottingham General Dispensary.*—Res. Surgeon. £250.
*Nottingham Hospital for Women.*—H.S. At rate of £150.
*Plymouth Corporation Hospitals.*—Anæsthetist. 2½ gns.
*Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.*—Res. M.O. for Isolation Hospital. £200.
*Queen Mary's Hospital for the East End, E.*—Pathologist. £750.
*Reading, North Berkshire Hospital.*—Cas. O. £150.
*Redhill, Surrey, Royal Earlswood Institution.*—Jun. Asst. M.O. At rate of £250.
*Royal National Orthopædic Hosp.*—Two Surg. Regs. Each £105.
*Royal Northern Hospital, Holloway, N.*—Second Ophth. S. Med. Reg. £200. Also Clin. Assts. for Neurological Dept.
*St. Albans, Herts County Mental Hospital, Hill End.*—Second Asst. M.O. £550.
*St. James' Hospital, Ouseley-road, Balham, S.W.*—Asst. M.O. £350.
*St. Leonard's Hospital, Hoxton-street, N.*—Sen. Asst. M.O. £550. Also Asst. M.O. £350.
*St. Mary's Hospital for Women and Children, Plaistow, E.*—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
*St. Olave's Hospital, Lower-road, Rotherhithe, S.E.*—Asst. M.O. £350.
*Samaritan Free Hospital for Women, Marylebone-road, N.W.*—H.S. At rate of £100.
*Southend-on-Sea General Hospital.*—H.P. £100.
*Swansea General and Eye Hospital.*—H.P. At rate of £150.
*Taunton, Taunton and Somerset Hospital.*—Sen. House M.O. At rate of £150. Also H.P. and H.S. Each at rate of £100.
*Weir Hospital, Grove-road, Balham, S.W.*—Jun. Res. M.O. £150
*Western Ophthalmic Hospital, 155, Marylebone-road, N.W.*—Sen. and Jun. Res. H.S.'s. At rate of £150 and £100 respectively.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Worcester (Worcester), Millport (Bute), and at Great Haseley (Oxford).

## Births, Marriages, and Deaths

### BIRTHS

BLEWITT.—On August 28th, at Poona, India, the wife of Lieut Basil Blewitt, R.A.M.C., of a daughter.

KENNEDY.—On Sept. 28th, 1933, at Broadhurst-avenue, Edgware, Middlesex, to Nancy Barbara (née Pickard), wife of Dr. Denis G. Kennedy—a son.

SHAW.—On Sept. 26th, at Heathcote, East Grinstead, the wife of Dr. H. B. Shaw, of a daughter.

STOKOE.—On Sept. 30th, at Lansdowne, Woodside Park, N., the wife of Dr. H. N. Stokoe, of a son.

### MARRIAGES

STEWART—ROB.—On Sept. 27th, at St. Mary's Church, Oatlands Park, Weybridge, Dr. Gilbert Reginald Shipley Stewart, of The Croft, Stafford, younger son of Dr. H. M. Stewart, of Dulwich, to Margaret Mary Rob, only daughter of Dr. J. W. Rob, of Oatlands Park, Weybridge.

### DEATHS

BOWER.—On Sept. 16th, 1933, at Elton House, Gloucester Ernest Dykes Bower, M.D., F.R.C.S. Edin., aged 79.

HAMILTON.—On Sept. 24th, suddenly, at Hove, Sussex, Charles Dai Hamilton, M.R.C.S., L.R.C.P., aged 70.

MAYO.—On Sept. 28th, at St. George's Park House, Great Yarmouth, Alfred Charles Mayo, M.R.C.S., L.R.C.P., aged 88 years.

WILSON.—On Sept. 29th, at Chippenham, Wilts, Mervyn Seppings Wilson, B.A., F.R.C.S., aged 79.

***N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.***

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. R. J. G. Parnell is placed on the retd. list.
M. H. Adams to be Surg. Lt.
Surg. Lt. (R.N.V.R.) J. E. Davenport entered as Surg. Lt. for short service and appointed to *Victory* for Haslar Hospital.

### ROYAL ARMY MEDICAL CORPS

T. D. Phelan to be Lt. (on prob.).

#### ARMY RESERVE OF OFFICERS

Lt.-Col. & Bt.-Col. E. Ryan, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

#### SUPPLEMENTARY RESERVE OF OFFICERS

Lt. G. F. Walker to be Capt.

#### TERRITORIAL ARMY

Lt. D. N. Nicholson to be Capt.
D. J. Campbell to be Lt.

### INDIAN MEDICAL SERVICE.

Lt.-Col. G. E. Malcomson retires.
Capt. S. M. Ali relinquishes his temp. commn.

# NOTES, COMMENTS, AND ABSTRACTS

## OUR BEST FRIEND*

BY A. E. BOYCOTT, D.M. OXF., F.R.C.P. LOND., F.R.S.
GRAHAM PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LONDON

SOME years ago I was gossiping with a lady of sense and experience about the possible careers which were open to her son. Believing then, as I believe more firmly now, that the medical course offers a boy or girl a better training for life than they can get anywhere else, I suggested that he should be a doctor. "No" she answered, "I shouldn't like Philip to do medicine; the body is such a nasty thing, especially when it is ill; besides, he would see women at their worst." We did not pursue the discussion on that occasion; but what she said has remained in my mind, perhaps because, as it seems to me, it contains more error in fewer words than is often achieved. It will at any rate serve us for a text this afternoon.

### The Goodness of the Body

From any discussion of her second statement, I would beg you have me excused. Let us turn rather to consider her other reason: "the body is such a nasty thing." How many people have said the same, how often have we all thought it. Our "vile flesh"—vile in Paul's sense of being worthless, vile in our current slang of being mean and beastly, always with the implication that we are in one way and another at variance with the house we live in and, as householders often do, expressing our dissatisfaction with it. To St. Francis it is "Brother Ass," to St. Augustine no more than a horrid vehicle of the carnal lusts of the flesh which we should get rid of as soon as may be. We realise now better than people did in his time that the body without the spirit is indeed worthless, though we have come to suspect that the spirit without the body may be a poor kind of wraith. But we are often enough vexed with the body none the less and complain about it because it does not fit in as well as we would like with our wilful and wayward affections.

Is this just or fair or kind? I think not, and I would like, if I can, to persuade you to a more friendly spirit. We are so used to finding in the body the ready servant of our will, whimsical and tyrannous as it may be, that we are apt to take much too much for granted. Think of all the simple pleasures of the flesh: the pleasure of drinking when you are thirsty, of eating when you are hungry (and sometimes when you are not hungry), of playing games and taking exercise till you are satisfactorily tired, of getting into a muck sweat and dropping into the sea, of sleeping, of waking in the morning and stretching yourself (the mechanism and meaning of that delightful experience might well engage the attention of Prof. A. V. Hill and Sir Thomas Lewis), of climbing mountains, of lying on the sofa. Think of these things and be grateful for a body which is so complacent and flexible and do not be cross with it if it sometimes says "I'm sorry, I can't," and if as time goes on it balks more often than it did: you can be sure at any rate that it is always doing its utmost to please you.

However, this is a medical school and the healthy body is not my particular business. "Especially when it is ill," said Philip's mother, and the concern of my professional life has been to try to make out what the body does when it is sick and injured. The more I get to know about it, the more does it fill me with wonder and delight, and the more does my respect and affection for the body increase. And as one broods over it all, some general principles begin to emerge which is the most delightful thing of all because the whole aim of the pursuit of natural knowledge is to discover principles which will pass as truths in helping us to go further, even if they are not the unattainable Truth.

#### WITH A CUT FINGER

May I illustrate this pilgrimage of pathology with some simple examples? You all know that if you cut your finger or your chin that it hurts and that the blood makes a mess, but you are reassured because you also know that the bleeding will soon stop and that in the course of a few days or less the wound will be healed. The pain annoys you, but you will, I think, realise that if the razor did not hurt you the very instant it cut into the skin a trivial nick might well be a serious slice before you realised what was happening. And how is it that the bleeding stops? Blood does not clot as it goes round the body inside the blood-vessels: that would never do, and when it does happen it gives rise to all sorts of troubles. But once the wall of a blood-vessel is cut it contracts, and when it and the surrounding tissues are injured, they produce substances which make blood coagulate so that the wound is soon filled with a clot of solidified blood. A small matter, you may say; but the unfortunate people known as "bleeders," in whom this mechanism fails and whose cuts go on bleeding, are so far handicapped in life that they very seldom grow up and have children. And then the wound heals and soon things are as they were and the body is whole again. Here, too, the injury itself produces its own cure. When cells in the body are injured and killed, ferments are set free which dissolve them and give rise to substances which stimulate the neighbouring healthy cells to grow and replace those which have been lost. The greater the injury, the more of these substances, so that the growth of new cells is proportionate to and exactly supplies the need for fresh cells. The body in other words heals itself. You may or may not make a fuss and tie up your finger or put spiders' web or cotton-wool on your chin; in so doing you are doing no more than giving the body some comparatively trivial help in doing its job in its own way.

#### WITH A HÆMORRHAGE

Or let us take a larger loss of blood such as might come from cutting the large artery at the wrist or those on the head with broken glass in an accident—such a hæmorrhage as will let out a pint or a quart of blood, which would be about a third of all that an adult has. In this instance the hole into the blood-vessel may be too large and the rush of blood out of it too fierce for the body to cope with unaided; unless someone puts their finger on the place the loss of blood will perhaps be more than the person can bear. But the body does what it can; the cut artery contracts and makes the hole smaller, and the sympathetic nerves are stimulated and rouse the liver to discharge a substance which hastens the clotting of blood—a change which passes off

* Opening address at University College Hospital Medical School on Oct. 2nd, 1933.

in an hour or two when it would be of no further use. When the bleeding has ceased or been stopped, the body finds itself in the difficulty that there is not enough blood to fill the blood-vessels. It is much the same situation as in a domestic water-supply when the intake pipe is too small; turning on the big tap in the scullery lowers the pressure so much that nothing can be had in the bedrooms or up the garden. And it is a situation which the body very much dislikes. To have the blood circulate properly, it must fit snugly and rather tightly into the blood-vessels; otherwise the heart cannot fill itself as it would and if it is not well filled it beats badly, so that if the blood-vessels are only partly full it is liable to fail altogether. What happens? The fall of blood pressure stimulates the nerves in the large vessels in the neck and messages are carried to all parts of the body which cause (1) an immediate general constriction of the smaller blood-vessels so that the capacity of the system is reduced to correspond with the diminished volume of blood, (2) the evacuation into the vessels of a reserve of blood which is kept in the spleen against such emergencies, and (3) a discharge of the special secretion of the small adrenal glands in the belly which in its turn increases the vaso-constriction, stimulates the heart, and sets free sugar from the liver—the most invigorating food the body can have. All this helps the body to carry on. And the refinements of the reaction are still wiser. Different parts of the body need a good supply of blood in different modes; it is wanted in the muscles only when they are active, in the skin only when sweating is appropriate, in the kidneys only when urine is to be secreted, in the stomach only when there is something to digest. These organs can be comparatively bloodless for a long time without much harm being done. But the muscle of the heart and the part of the brain which presides over breathing must have plently of blood continually; even a brief intermission will bring their activities to an end and result in death. Correspondingly (and I use that word deliberately) we find that the general narrowing of the blood-vessels does not involve these vital parts; blood is cut off from the muscles (a person after a severe bleeding has no interest in running) and the skin (he feels cold) but not from the brain and heart (which he cannot do without). In our domestic analogy, if we had to reduce our piping, we should do without the garden and the bath and maintain the kitchen and the closets.

So the body tides over the first emergency. But the baser organs cannot do without blood indefinitely, and this can be secured only by restoring the volume of the blood to its original level and allowing the vessels to relax to their normal size. To do this, liquid is sucked in from the tissues to the blood; it is not an instantaneous process and may take hours or sometimes a day or two to complete. To bring it off, the body needs plenty of water, which it does its best to receive by cutting off the blood-supply of the salivary glands, stopping the secretion of saliva, making the mouth dry and so causing thirst. The circulation through the walls of the intestines is also left open so that water is absorbed quickly. All of which is often promoted by the surgeons by putting in blood or water; in doing so, they are helping the body in its own way, not in theirs.

### Its Code of Conduct

I have no doubt that we still have much to learn about this particular response to an injury. But we know enough about it I think to ask ourselves what does it all mean? What is the rationale of it?

If we add 2 to 2 we get 4 and there can be no other result; it is inherent in the nature of 2 that if you add it to 2 you have 4, and in the nature of 4 that it is the consequence of adding 2 to 2.

If I take this knife and leave go of it, it falls to the ground and I need not do it more than once to get you to agree that it happens every time I try the experiment. "Of course it does," you say, and if you are a trifle hasty you may add "the fall necessarily follows your letting go; you could not expect anything else." But I think a little reflection will show you that there is really no a priori and inevitable connexion between my leaving go of the knife and its falling down; from the nature of the case alone it might go upwards or sideways or stop where it is. We find, however, as a matter of endless experience, that knives and similar objects free to move in air do, in fact, always fall down. And further inquiry shows us that they fall down because the earth is beneath us and much bigger than the knife, and finally that any two bodies free to move attract one another in proportion to their bulk and the distance between them; if there were two knives and no earth, the two knives would both move towards one another until they met. This is the general principle which underlies the familiar fact that if you leave go of a teacup or a baby it drops onto the floor. We summarise it by saying the attraction is due to "gravity." We have no idea what gravity means or how it comes about; our law of gravitation is simply a summary of a large and consistent experience, and no one who was ignorant of the facts could have predicted the law. Knowing the law, he can predict a good deal of which he has had no experience.

Between cause and effect in the body there is often no obvious a priori connexion. We may say, I think, that it follows from the nature of the case that if you cut into a blood-vessel the blood will come out, but we certainly cannot say on the same grounds that the bleeding will stop or that the cut will heal. You know they will as a matter of everyday experience. No more could anyone predict from the nature of the case that a larger hæmorrhage is followed in due sequence by an alteration in the coagulability of the blood, by a contraction of the blood-vessels, by activity of the suprarenal gland, an absorption of water from the bowels, and the other events which I have sketched to you; nor does common everyday experience inform you of these more intimate details which are, in fact, probably unknown to many of you. What general principle connects these effects with their cause? Why surely nothing less than this, that the body responds to injury in such ways as are appropriate to getting over the difficulties which are presented to it and to healing the injury. The body in short behaves sensibly, and the more we know of its behaviour when it is ill the clearer does it seem that this is the principle which determines what happens.

#### DOUBTS

Some people will find a difficulty in believing that this is indeed the plan on which the body works. Some will feel piqued at the notion that the body knows better than they do. Others will complain that it introduces a suggestion of purpose which so many find intolerable. I do not understand why, for "purpose" is a curious word which may mean several things, and the more I know of the way the world works the less easy do I find it to get away from the feeling that it goes on in a way which has every appearance of being "purposive." No student

of natural science abates one jot of the dignity of his occupation by a frank belief that the operations of nature are directed by God, though of course he has to realise that his own share in making things plain is perhaps more humble than he thought. Others again will refuse to believe that an effect follows from a cause unless they can trace out all the connecting links, and it must be confessed that it is only in a minority of instances that we have yet got even a rough appreciation of what these links are. Such people are depressingly agnostic; they do not even believe that the mind has an influence on the body because the mechanism of the connexion is as yet unknown to us; if they add an attempt to be logical, they believe in very little. And others may find a difficulty in imagining how such a state of affairs has come about. How Paley would have revelled in such indisputable proofs of the wisdom and goodness of God. And how easy it is for anyone who really believes in natural selection and evolution and their implications to see how such mechanisms as I have described to you have come to be an integral part of live animals; mammals could hardly have existed without an adequate way of coping with the emergency of hæmorrhage without the help of doctors and nurses.

### The Law of Injury and Disease

These difficulties are then I believe of no great weight. And if they were substantial, we should still be faced with the fact of experience that *when the body finds itself in trouble it does things which are helpful;* this is a law of injury and disease which in its own field is as valid as the law of gravity. It is not merely that unexpected things happen which we could not have predicted from the bare incident which has occurred; it is that everything that happens runs as it were into the one groove which ends in restoration. After a hæmorrhage anything *might* happen; the temperature of the brain might rise 10°, or the kidneys might become fatty, or the rate of metabolism might be doubled. In fact these things do not occur, though without any principle to guide us we might suppose a priori that they quite likely might. And the unexpected things which do happen are connected with one another and their cause only in one way—by what they achieve.

Such then is the plain truth which runs through and consolidates all our experience of the body when it is ill. Apart from teaching, my job in life has centred round the examination of the body after death and the lesson which I am continually learning from post-mortem examinations is the versatility and courage, the ingenuity and determination with which the body strives to keep our house from tumbling about our ears. I do not wonder that people die; that is easy enough. What I marvel at is that they go on living with bodies so maimed, disordered, and worn out. In the end, when it has done all it can, the body has to give in and we have to fall out of this splendid procession of life; but it is not from idleness or wilfulness, and as I come away from the post-mortem room I often feel inclined to say "well done, good and faithful."

And so I would have you think more kindly of your vile flesh. When some accident happens which hurts you, be grateful for the pain, for it is your best protection. When you break your leg, the one thing necessary for salvation is that the broken bone should be kept quietly at rest so that it can heal itself; if it didn't hurt you to move it, you would waggle it about and get into a dreadful mess. When you have influenza, be glad you feel ill; the one thing you need is to lie quietly in bed for a few days, with plenty to drink and a cheerful nurse; if you didn't feel ill you wouldn't go to bed, and then anything might happen. Believe, if you can, that the body knows best, and respect your symptoms.

### The Body Deserves Affection

Why do I want to know about all this and want you to know about it too? It gives me, who am not a practical doctor, a great deal of æsthetic pleasure; there is something in the tale which warms me. And, if a pathologist may venture to have an opinion, it seems to me of the very essence of doctoring. If you are going to spend your lives helping unhealthy bodies, you will do it all the better if you have a feeling for the body and an understanding of its ways and habits. You cannot get on with a list of particular diseases and injuries in one column and a list of what to do in another. What a sick man generally wants is to get rid of his responsibility for what he does and to know what is going to happen to him. Events and combinations of events will often be presented to you which you have never experienced before, and your power of prediction will depend on your appreciation of the general principles on which the body acts. You want to know and understand it in the same way as you know the people you are fond of. When Jane comes to know Tom well enough—I am not sure it would work the other way—she knows what he thinks before he speaks, and can guess pretty well what he will do under any circumstances which happen to arise. If you have friends—and by friends I mean people who will let you be good to them—and they need help, you want to help them in their way, not in yours. And so it is with the body. It is ready enough to help itself, and you cannot do it better service when it is ill than to find out what it is trying to do and help it to do it. Be friends with it and love it, for it is your own best friend—patient, faithful, incredibly long suffering, and woefully misunderstood.

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## VOCAL DISORDERS

IT is proper that laryngologists should be cognisant of the methods employed by teachers of singing, and a little book on the cause and cure of vocal disorders[1] by a teacher has medical interest. It will be agreed that the general cause of functional dysphonia is distortion of the resonator; but Mr. Evatts describes this as consisting of the pharynx, the nasopharynx, and the mouth, and no mention is made here, or elsewhere in the book, of the nasal cavities, which perform such important functions in this connexion. The author rightly insists on a well-balanced position of the resonator, with the soft palate neither raised nor depressed, thus allowing the branches of the resonator to maintain their natural proportions. In his opinion distortion of the resonator is set up before the voice is used at all by the way in which it is affected by the intake of the breath. He believes that the change of quality of voice, described as a change of "register," is due to nothing more than distortion of the resonator—that is, to a wrong use of the mechanism—and that the theory of registers is responsible for many singers' troubles. He gives details of a large number of vocal and breathing exercises, the problems of the adolescent voice, and a short chapter on stammering. Everyone will not agree with all his methods and opinions, but the book shows evidence of his wide experience, and is written in a lucid and careful style.

[1] Vocal Disorders, their Cause and Cure. By Edgar T. Evatts. London: J. M. Dent and Sons. 1933. Pp. 85. 3s. 6d.